The Builder.

VOL. XXX.—No. 1543.

The Effect of the Present Industrial Movement on the Value of Railway Property.

In several occasions we have been led to refer to the subject of small-gauge, light, railways. Since the matter was first mooted, we have never failed to regard it with interest; and we have waited, with the patience which was necessary, for such further details of actual experience as should throw a decisive light on the character of the scheme. At the present time the question has assumed additional importance, from the fact that the condition of the railway interest of the country is likely to be affected by that extraordinary revolution in prices, wages, and luxury of living, which has made such rapid progress within the present year. The loud calls, apparently not without success, for money for every possible and impossible purpose to which a limited capital can be applied, are so numerous and repeated, that it is evident that it will not be from inability to collect capital that the failure of any thoroughly good mode of investment is to be anticipated. It is, therefore, at a very appropriate time that we find ourselves in possession of further information as to what has been actually done, and as to what is in course of execution, for which we have more than once expressed a desire.

It is of considerable importance to the prosperity of the country that the position of our great railway interest, in face of the augmentation of prices and of the rate of wages, together with the general diminution in the hours of productive labour, should be steadily regarded. The total receipts of our railways, in 1869, were given as 41,595,661*l*. Forty-seven and a half per cent. of this intake was absorbed in working expenses. For the sake of round numbers, we will assume the income of the year ending at Midsummer last at forty-four millions sterling; out of which, at the above-named rate of profit, something like twenty-one millions will have gone to pay working expenses, leaving twenty-three millions to remunerate the proprietors. The return thus made may be taken at an average of 3·6 per cent. (three and six-tenths) on the gross total outlay. Owing to the enforced closing of the capital accounts, and the steady increase of traffic due to the commercial growth of the country, the actual income of the lines as a whole has reached a point beyond which its development is increasingly lucrative. The benefit has begun to accrue, in the most tangible manner, to the holders of original stock, who have long been overweighted by the preferential and guaranteed charges. Into this, however, we do not propose now to enter; our point being, that the broad general prospect was, but a little while ago, one of an unusually satisfactory character; a fact of which the public showed due appreciation by the sensitive barometer of the Share Market.

In face of an increasing traffic which encouraged such brilliant anticipations, we have now to place the unprecedented movement in those items which form the main working expenses of railways. Coal, iron, and labour, as we have recently shown, are gaining upon gold. That is to say, a larger weight of gold has now to be given, than was the case a year or two ago, in order to purchase a given amount of either of these commodities. But it is exactly in these items of coal, iron, and labour that the main outlay of railway companies consists. We are not in possession of sufficient details to enable us to calculate with absolute precision the influence of this rise of price upon future dividend. Indeed, the calculations of one month may prove inapplicable in the next. But we may form some idea. To rate the extra cost of labour alone, arising, or likely to arise, from the short-time movement, and from the adjustment of wages in one employment to the advance obtained in others, at 10 per cent., will probably be far within the mark. To estimate the advance on the price of materials at 30 per cent. will also leave a margin. If, therefore, we roughly take the general augmentation of working expenses at 20 per cent., or one-fifth, of their recent amount, we shall find the division between the amount spent in earning and that applicable to dividend to be materially modified. We shall require twenty-five millions and a fifth to work our lines. We shall only have eighteen millions and four-fifths to distribute as interest and dividend. We thus find two-thirds per cent. struck off from the average rate of dividend at a blow; supposing, of course, that no great increase be effected in traffic returns.

There is not the slightest doubt that, by adopting such a wise system of mutual aid and forbearance as would be proper if all railway income made a common purse, very much might be done to counteract this probable deficiency. That we will not now discuss. Let us assume, if necessary, that such a union has taken place. The limits of the savings thus to be effected are definite. The limit of the rise in cost is indefinite. The obvious remedy will be rise of fares. But rise of fares, so far as experience goes, means arrest of growth, and check to prosperity.

It is, therefore, only in such an extension of the railway system as shall direct fresh streams of traffic to the centre, as well as to the extremities, of our great network of iron, that we see a probable resource for the maintenance of our enormous railway property, in a state that shall combine the national advantages of the best service of the public, and the due payment of the proprietors of our 14,000 miles of railway. This development cannot take place by means of branches, such as we formerly attempted. A certain amount, not of prospective, but of actual, traffic must exist, in order to justify the construction of a branch. We have, long ago, exceeded the limits of a wise economy in the matter of branch lines; nor do we hold that delusive estimates of the great saving that can be effected, for example, by making the rails themselves lighter, can do anything but mischief. Looking at our normal gauge of 56½ in., we have long had materials for striking a balance between economy of construction and economy of working. Undue saving, in the first instance, is not economy. The very idea of a railway is, that by reducing friction and obviating all unnecessary work in the way of overcoming gravity, recurring cost may be proportionably reduced. We cut hills and embank valleys for the latter purpose; in fact, to save going up any hill that can be avoided, and thus lifting weight for no result; and we lay iron tracks for the former. We have found it worth while to lay out nearly 650 millions sterling for this end; and so far as lines of the ordinary gauge are concerned, those that we may make in future will probably cost more per mile than those which we have already made.

On the other hand, no one can share in those distant excursions to which London has rushed, as if in one great exodus, on the close of the session; still less can reside for a few weeks in a village separated by only three or four miles of cross-country road from the nearest railway station; without seeing how commercial life is nipped and strangled by disconnexion with the great network of traffic. The question of transshipment, or rather of change of vehicle, enters for something into this; but it is far from being the most important item. In our early "battles of the gauges," and in almost all disputes concerning railway extensions, canal development, and the like, we have attributed rather too much importance to this single item.

It is quite otherwise, however, with road-traffic. When we exchange the railway for the van of the carrier, or the cart of the farmer, we go into another order of things. Progress then has to be measured by yards, instead of by miles. Every hill is a separate difficulty, to be separately and painfully encountered. Instead of communication with the great circulation of the country by every train, intercourse is reduced to a daily, an alternate daily, or a twice-a-week, interchange. A moral effect is combined with that which is physical. It is more difficult to send, or to go, to the nearest station than to continue the course from that station to the market-town. In fact, *on* the railway-lines we have the England of the nineteenth century; *off* them, we have the England of the eighteenth.

The one assumption which lies at the base of this great national difficulty is, that a railway must have a track of 56½ in. in width between the rails. That granted, the *statu quo* must remain, or, at least, can only be gradually modified as the gradual growth of the country will warrant. But should that assumption be granted?

In the whole course of industrial art we may watch a sort of periodical oscillation between the two opposite (but not opposing) principles of strength and of lightness. They are the Jachin and Boaz of the mechanic, no less than of the mason. Our progress has been often alternate; as a man plants first one foot, and then the other, on the ground. But in the ultimate pattern of the engineer, the living organism, we find that these male and female principles are firmly wedded. From this union result the most astonishing mechanical triumphs of nature,—those displayed among the aërial tribes. In the megatherium or the deinosaur we may see a magnificent display of well-ordered strength,—a veritable broad-gauge animal. In the swift and in the dragon-fly we see that combination of material and of structural design which unites adequate strength with requisite lightness, and enables the animal to exert a velocity of movement that beats a firm and supporting path through the air itself.

Velocity, we learn from the phenomena of flight, as well as from some that are more within our present power of production, is an element of such importance that we are as yet far from having mastered the great subject of its relations. It is the feature which distinguishes dynamics from statics. The bicycle may be cited as an example of the manner in which a mechanical contrivance may be made to behave in a manner which was not anticipated, by the simple fact of being propelled at a given speed. Many things conduce to the conclusion that we are as yet only in the infancy of mechanics. If so, it is by the combination of strength with lightness, and by the rendering low power available for producing high velocity, that progress will be made. Ever since the steam-engine entered upon its Promethean existence, it has given indications of the direc

tion in which its development should be sought. Let any one compare one of the massive, stationary, heavily counter-balanced Cornish pumping-engines, with one of those handy and obedient little donkey-engines (far more tractable, as well as fifty times more strong, than their four-footed godfathers) which raised stones and pumped water for the service of the Thames Embankment; and he will form a very good idea of the kind of progress of which we speak.

Now if we look at the history of railway locomotion we shall find that the mechanical progress made, great as it has been, has been mainly in the opposite direction to that which we have thus indicated. Messrs. Braithwaite & Ericssen's "Novelty," which attained the highest speed in the famous competition of 1829 (though it did not obtain the prize, from want of duly distributed strength), weighed, with water and fuel in the tank, 3 tons 17 cwt. 14 lb. The "Rocket," of Messrs. George & Robert Stephenson, which did obtain the prize, weighed 4 tons 5 cwt., exclusive of a tender which, when filled, weighed 3 tons 4 cwt. In 1830 7-ton engines were considered heavy. In 1840 the weight had doubled. In 1850 we had 25-ton engines; in 1860 35-ton engines. There are goods engines now at work on the Continent that weigh, exclusive of tender, 45 tons; and a design by M. Meyer, which has been much commended, contemplates a weight of 60 tons, exclusive of tender. Now if we consider the velocity at which these enormous masses of iron are whirled along the rails, the blows struck by the revolution of the driving-wheel, the lateral stress caused by the conical tyre, and the rigid resistance which the whole surface of permanent way and substructure must present to the terrific force of impact, we shall find that a railway, according to M. Meyer, must be more than twelve times as strong as a railway, as it was contemplated by Captain Ericssen. We have made gigantic strides; but we have made them in a direction involving the most prodigious outlay. It is at least open to question whether we have not made them in a wrong direction.

One or two engineers think that we have. Not only so, but they have the courage of their opinions. They have not contented themselves with an abstract view of the subject. They have reduced their principle to practice; and they assert that the results of that practice justify their views. Thus far they have a *primâ facie* case, they have been working in the direction indicated by the organic engineering of nature; while the gradually increasing weights piled upon the driving-wheels of the locomotive, from the time of Ericssen to our own, have been so many triumphs over reluctant and abhorrent nature. She has, perhaps, not been without her revenge.

From Portmadoc to Festiniog, in Merionethshire, there was constructed, about forty years ago, one of those small tramways, worked by horses, which are the lineal ancestors (we do not mean to pun) of the railways of Great Britain. We are told by Captain Tyler, formerly Government Inspector of Railways, that it was made by a gentleman, who ruined himself by the undertaking, to reclaim a large piece of waste land from the sea, and to carry down slates from the quarries in the Festiniog mountains for shipment in the latter port. The length of the main line is 13¼ miles, and there is an additional mile of branch. The average rise to be overcome is 1 in 92, for 12½ miles. The steepest gradient over which passengers are carried is 1 in 80; but some portions of the lines, which radiate to the various quarries, are worked by locomotives over a gradient of 1 in 60. The country is exceedingly rough. Ravines are crossed by embankments of 60 ft. in height, with a breadth of 10 ft. at the top. One embankment, at Traeth-Mawr, is 900 yards long; the deepest cutting is 27 ft. The sharpest curve is one of 1¾ chain radius, and others vary from 2¼ to 8 chains in radius. The line is so sinuous that a moderately long train may be on two or three curves at once. It was originally laid with rails of 16 lb. per yard, which were replaced by 30 lb. rails. These were in use for eighteen years, and were in their turn replaced by double-headed rails of 48 lb. to the yard. The joints are fished, and the cross sleepers, 3 ft. apart under centres, and 2 ft. under joints, are of larch, 4 ft. 6 in. by 9 in. by 4¼ in.

The gauge of this little mountain line is, accurately measured, a little under 2 ft.; say 1 ft. 11¼ in. It is worked by specially-constructed locomotives, the speed having been limited by the Board of Trade to 12 miles per hour. With the Fairlie engine, an experimental speed of 30 miles to 35 miles an hour is said, by Mr. Spooner, the engineer, to have been attained. The Festiniog line can hardly be considered as a fair criterion for a small gauge, as it was not originally constructed for locomotive power; and the capital account has been increased by the expenses of conversion and change of plant. Still the accounts given of its traffic show a limitation of working expenses to 35½ per cent. on the receipts, and a net profit of 12½ per cent., or more than three times the average net earnings of English railways.

The chief sources of information as yet at the disposal of the public, with reference to the important question of small-gauge railways, are the compilation by Mr. Spooner, of which we gave a notice some months since, and the little book by Mr. Fairlie, to which we referred in a recent number. The great literary defect of these books is, that they are argumentative rather than explanatory. The facts which they contain are so mixed up with the estimates of what is expected, that it is difficult for the engineer, and all but impossible for the ordinary reader, to winnow the chaff from the grain. Not that the chaff, as we call it, is by any means worthless. Arguments and estimates are both of a very sensible nature. But, after all, literary ability is a great desideratum, and the best cause may be stifled by advocacy which, while honest and intelligent, is not lucid and well arranged.

The opinions of foreign engineers of eminence are cited by Mr. Fairlie, and to some of them we attach great weight. M. Eugene Flachat, who must now be almost, if not quite, the *Doyen* of the profession in France, has reported on the small-gauge lines constructed up to 1867. Mr. Nördling, formerly chief engineer of the Orleans railway, and now one of the chief engineers of the Austrian railways, a gentleman of whom we had the opportunity of forming a high opinion when in his former post, has recently collected and published important information on the small-gauge railways at pesent being worked. These reports ought to be brought before the English public.

A line 14 miles in length is in operation in the Broelthal Valley which pays a dividend of 5·75 per cent., with a daily traffic of 40 tons per mile. A line of 8 miles long has been constructed from Tavaux to Ponsericourt, in France, at a cost per mile of 1,000*l.* for construction, and 1,920*l.* for rolling-stock. Between Antwerp and Ghent is a railway of 3 ft. 7 in. gauge, which pays between 7 and 8 per cent. on its capital. In Austria the Lambah-Gerumden Railway has been open for several years; the gauge is 3 ft. 6 in., but the stock is old-fashioned, and the speed slow. In Norway M. Carl Pihl has constructed lines on a 3 ft. 6 in. gauge, through very unfavourable country, at mileage cost of 5,300*l.* in one instance, of 4,600*l.* in a second, and of 3,142*l.* in a third; including rolling-stock, material, and workshops. A 3 ft. 6 in. gauge line has been constructed in Canada, under Sir Charles Fox & Sons as engineers, called the Toronto, Grey, and Bruce Railway, at a reduction of about 25 per cent. on the estimate for a 4 ft. 8½ in. line. From Denver, in Colorado, a line is now in course of construction to the city of Mexico, on a 3 ft. gauge, at a saving of 36 per cent. as compared with the Kansas Pacific Railway, of the ordinary gauge, which was constructed by the same engineers and the same contractors. Thus enough evidence is already in existence, if it were carefully collected and lucidly stated, to allow of the formation of a very definite judgment on the practical cost of small-gauge lines.

Assuming, however, that the contemplated economy of from 25 to 36 per cent. on cost of construction may be realised, this forms but one, and that by no means the most important, of the advantages claimed for the small-gauge system. For the mechanical reasons which we have above adduced, we are prepared to accept the statements of the great saving to be effected on the actual cost of carrying goods and passengers by light and well-designed rolling stock. The dead weight of the ordinary goods-trains, in proportion to the live, or paying weight (exclusive of mineral traffic), in the United Kingdom, was stated in a paper read before the British Association in 1870 at 7 to 1. In passengers it was actually 29 to 1. In France the proportion of dead to live weight is about 1¼ to 1 in goods, and 5 to 1 of passengers. Our French neighbours are noted for their tyranny over their passengers, whom they pack almost like sheep, and drive into pens with stern persecution. We see the economical result, as compared to our own more independent habits. In the United States the average dead weight of passenger stock is to the paying weight as 8 to 1.

Now, on the Norwegian small-gauge lines, the dead weight, in passenger stock, is in one case 2·15 to 1, and in another, 1·82 to 1. On the Novgorod Railway it is as 2·7 to 1; on the Livny Railway as 2·5 to 1; on the Dunedin and Port Chalmers Railway, in New Zealand, as 1·75 to 1. In goods, on six separate lines on the small gauge, 3 tons of net weight are carried per ton of dead weight, or rolling stock. On the Montepone line 2½ tons, and on the Broelthal Valley 2 tons, of freight, are carried per ton of stock.

Thus, we find an economy which, if the figures stated are correct, is not one of estimate but of fact, of at least 4 to 1 in the carriage of passengers, and 3 to 1 in that of goods, is to be effected by the employment of the small gauge as compared with that in ordinary use. That this is not an advantage confined to very short lines may be inferred from the fact that the length of the line in construction from Denver to Mexico, above mentioned, is a thousand miles.

We call serious attention to the above statements. We make no pretence to the power of prophecy. Still, that the adequate investigation of a great industrial question may enable an engineer to estimate with some certitude the course of its proximate development, we think our recent articles on the coal question have demonstrated. We now think it pretty clear that an unfavourable change is at hand, unless some measures be taken to avert it, in the value of our railway property. And we invite those most deeply interested to investigate that method of turning seven years of dearth into seven years of plenty, which is offered by the developement of the small gauge.

GLEANINGS AT THE BRIGHTON MEETING.

Sewage and Sewer Gases.

In a paper on this subject,—

Mr. W. J. Cooper pointed out that the noxious exhalations rising from the drains of large cities are daily increasing in quantity, and that they threaten serious damage to the public health. Cases of drain-poisoning are not uncommon, and it is difficult to find a thoroughfare in the metropolis that is free from the foul and sickening odour which ascends through every grating communicating with the sewers. This is in spite of the millions that have been spent upon London drainage, and the sewer gases are still the greatest difficulty in the way of the sanitary engineer. It has even been suggested that the only way to treat them is to provide for their free escape into the atmosphere; and a letter recently published in the *Times* gives advice that the sewer gas should simply be diluted with air in every direction, and that tall chimneys should be sent above the houses, so as to afford outlets for it in regions above the heads of the inhabitants. So desperate a remedy could scarcely have been proposed, except in recognition of a really imminent danger. At a time when strenuous efforts are being made to secure purity of atmosphere, when Smoke Acts, and others of a similar tendency, are being rigidly enforced, the idea of building tall chimneys to distribute sewer gases over our dwellings seems distinctly retrogressive. We should rather look to chemical agency for effectual and prompt assistance; and it is perfectly practicable to arrest the fermentation of sewage during its passage through the conduits and to prevent the formation of gas. While watering the roads and streets of towns during the last four years with a solution of mixed deliquescent chlorides, the author had found that the waste solution running into the drains had exerted a marked effect in preventing the unpleasant smell formerly proceeding from them; and he had thus been led to institute experiments which had convinced him that the drains of London and other large towns could be kept perfectly free from gas at an annual cost of about 1s. per head of the population. He proposed to introduce chloride of calcium, either in powder or solution, directly into the drains and sewers at times when they were nearly empty, and especially in times of drought. The effect of chloride of calcium upon carbonate of ammonia was to decompose it, and to form neutral chloride of ammonium and carbonate of lime; but by treating the sewers with a chloride of calcium preparation at proper times the generation of

ammonia and its accompanying products of decomposition would be prevented. Ammonia is generated in sewers by the decomposition of urea in the presence of water. The progress of this decomposition consists in the fermentation of the urea, which product, *plus* water, is equivalent to carbonate of ammonia.

Mr. Longstaff, speaking on the paper just read, said the evil of sewage fermentation was very great, and it would be well to consider what remedies there were for them. He stated that he had factories in Yorkshire, and had sought a remedy for these evils in making such connexions between the sewers and large factory-shafts that the gases passed through the furnaces and thus lost their noxious character. He believed that this plan had been effective, and he thought that the same course should be adopted wherever there were high shafts in the neighbourhood of sewers. He regarded the subject dealt with in the report as of twofold importance,—in its sanitary bearings and in respect of the utilisation question. He believed that the soil of England would bring forth threefold what it did if the sewage were applied generally; but it was the misfortune of this country that the agricultural mind was slow to be moved from the habits of previous ages, and, for another thing, the country suffered from those engaged in farming not possessing sufficient capital to carry on their business properly. He considered that in dealing practically with the question of the utilisation of sewage,—in the giving what the country now greatly needed,—the means whereby the sewage, now a nuisance to our towns, might be profitably employed by the agriculturists,—the committee had done nothing. Experiment after experiment had been carried on, but no practical results had been given such as would be of value to the country. He expressed a desire to know whether this want of practical information was attributable to any of the gentlemen whose names were on the committee not attending.

Professor Williamson, in answer to Mr. Longstaff as to the practical value of the committee's researches, said that practical value was to be seen in the fact of its having been ascertained that in the use on a farm of 100 parts of combined nitrogen, about 40 parts were found in the plants grown,—that was nearly one-half, and 10 per cent. went off in the effluent water, in the form generally of nitrates, but in a small degree differing according to soil over which it passed. That left 50 to be accounted for, and he believed these 50 parts would be found in the soil, which was to that degree enriched. The 10 per cent. which passed off in water was not sufficient to be noisome.

Mr. Hope said the value of sewage in the growing of crops could be easily estimated from a short statement of facts. In Cheshire the allowance was made of 3 acres to keep each cow in grass—on some good farms 2 acres. Now, with the use of sewage as a manure, he would undertake to grow sufficient rye-grass to keep four cows to the 1 acre, and he could go to five cows to the acre. He could grow 80 tons of Italian rye-grass to the acre, and could go to 100 tons an acre.

Mr. Scott referred to the difficulties which Parliament had created by refusing complete legislation upon this subject, and pointed out that Birmingham, by the vote on Sir Robert Peel's objection to the utilisation of the sewage there, had been thrust out of existence in the work that town was ready to undertake. He also said that the Public Loans Commissioners had refused to grant loans to other towns, whereby they might undertake to work out the utilisation of the sewage. He pointed, as another example of the difficulties of towns in this matter, to the case of East Ham, which stood close to two rivers—the Lea and the Thames, the conservators of both which had refused to admit the drainage to the waters under them, and when the district proposed to have a sewage farm, the Government inspector, who was opposed to sewage farms and irrigation, had refused the local authorities the necessary permission to undertake this means of ridding themselves of their sewage.

Professor Corfield.—With regard to the proposed connexion, for the purposes of ventilation, of the sewers with chimney shafts, reminded those who proposed this that some gases from sewers were explosive, and that explosions had actually occurred through such connexions. He added that he did not believe typhoid fever was caused by the sewer gases, but he said he believed this disease was caused by the waste pipe in the cistern being directly in connexion with the soil of the closet, and thus contamination of the domestic water ensued, leading to disease and death.

A Common Migration from the East, shown by Archaic Remains in America and Britain.

In a paper on this subject, Mr. Phené drew attention to a paper read by him last year at the meeting at Edinburgh, in which he had referred to some remarkable mounds in North Britain, which he considered were identical with the Serpent and Alligator mounds of America. He stated that since that meeting he had opened the most perfect of these British mounds, and with very satisfactory and interesting results; but as the investigation had been published, he should pass on to other matters. He pointed out various difficulties he had met with in coming to an accurate decision about the mound, but how, finally, he found, on reducing it to scale, and taking the various levels, that it agreed almost entirely with the Egyptian Urœus and the Phœnician serpent deity, each of which is represented in relics now extant as in the precise position of the form of the mound, and each with the solar disk at its head, which is found to correspond exactly with the cairn formerly described as the head, but which is now found to be in the position of resting upon it, assuming the figure was placed vertically, instead of horizontally. The author next proceeded to show that his observations on this point also explained the only ambiguity in the case of the Great American Serpent Mound at Ohio, which, he also argued, is surmounted by the solar orb, thereby agreeing with the Egyptian, Phœnician, and, as he claims, British representations also. He quoted a number of authorities to show that the words O B, meaning Serpent, and O N, meaning Sun, represented the Sun and Serpent deity, commonly worshipped in Egypt and Phœnicia; that the same word, with the addition of the letter I, is found in Africa, OBION and OBONI; both represented serpent and solar deities which were worshipped by some tribes in a visible and sensual manner, and by some in a spiritual sense. He showed how rare places with these component names are: one only in Europe; four of five in Asia, where the worship of the Sun and Serpent still continues; those already quoted in Africa; and one only in America directly: but he proceeded to show that some of the American names in the districts of the ancient mounds assimilated very nearly to these, making allowances for no greater variation than had taken place in the form of names in their transmission from Greece to Rome, and concluded his argument by claiming for Oban (the town near where the Argyleshire mound is) the name of "the place of the *Serpent and Solar Deity*" AB-ON or OB-AN, which he quoted authorities to show were used indifferently, as EBOE and OBOE are in Africa, each having also that meaning.

The Moabite Expedition.

Dr. Tristram, in the course of his paper on this subject, spoke of the "Antonine Itinerary" as another centre for exploration, from which the most remarkable and important discovery was made. The ruins of a magnificent palace, far more perfect than anything yet found in Moab of so early a date, were discovered on the borders of the desert, east-south-east of Heshbon, and form a new problem for our antiquaries at home. A quadrangle of freestone encloses a palace of brick. The quadrangle is 170 yards on each side, and furnished with semicircular bastions. On either side of the only entrance is a façade of carved work, 180 ft. in length and 17 ft. in height. Animals, birds, flowers, fruit, and even men, are chiselled with great thoroughness of work and delicacy of touch. The whole is in a marvellous state of preservation. The vaulted roofs of eight chambers of the palace yet remain. The plan and details have led Mr. Fergusson to conjecture the Persian conqueror Chosroes to be its author. Sir Henry Rawlinson questions the soundness of this opinion, on the ground that a military invader who merely crossed this tract on his way to Egypt never had sufficient hold upon the country to attempt such a work. Be this as it may, A.D. 600 must be somewhere about its date. The Arabic name, Umm Shittah, gives no clue to the history of this remarkable place. West of the direct route referred to above, the gorge of the Kallirrhoe, with its hot baths, where Herod the Great tried for a cure, was most thoroughly explored, though not unknown before; but Makaur, which must surely from its modern name and its similarity of position to the description of Josephus, answer to Machœrus, was reached for the first time.

The Brighton Intercepting Sewer.

This was fully described by Mr. J. G. Gamble. He said,—"A portion of the Intercepting Sewer has now been in use for about a year, at Cliftonville: that is to say, the drainage of Cliftonville runs along it for a short distance. Although the gradients of the road at this end of Brighton are by no means steep, and the gully-traps are said to be good, yet the quantity of silt-like material and large flints that come in is quite incredible. This has to be removed by hand. At Hastings there is a very fair system of flushing by aid of the tide in operation, and the gullies are better constructed than usual, having a special catchpit beside the actual water-trap of the gully. Nevertheless, sand collects at every junction, and has to be taken out by hand. . . . . But not only does the road-drift create an obstruction which collects other and more noxious materials, but it often sets hard like concrete, and has to be dug out with pickaxes, with no small damage to the brick lining. Whenever possible, road-gullies ought not to go into the sewers: in front of Brighton they might, and some do, go on to the beach. No objection could be taken to this being done, if a good system of scavenging for horse-droppings, like that in use in some parts of London, were in practice." Upon the subject of ventilating-shafts, which are to be placed at intervals of about 200 yards in the town, and 400 yards in the country, Mr. Gamble said,—"The position of the intercepting sewer precludes us from using what is, perhaps, the best way of ventilating sewers,—viz., by tall shafts taken up by the side of houses and above the levels of the roofs. . . . . It has been suggested to move fans by aid of the current below; but, apart from the liability of any such arrangement to get choked, the worst smells are given off when there is least water." "An objection has," says Mr. Gamble, "been made to the intercepting sewer, that it is an elongated cesspool. But it is surely worse to have the sewers as they are at present than to have a cesspool long enough and so placed that the sewage will run right away out of the limits of the town. As pointed out, even if 300,000 cubic feet were backed up in the sewer at high water, it would not reach within a mile of Kemp Town, and all the gases would pass up the air-shafts on the Newhaven-road. The outfalls under the present system are equally blocked at high water, but the gases have nowhere to escape except back into the town." In reply to questions, Mr. Gamble said he could not say what would be the cost of the sewer, as only about one-third was now finished. The engineer's estimate was 80,000*l*. The works were stopped at present, in consequence of a change of contractor: otherwise, Mr. Hawkshaw would have been happy to conduct members over them.

The Barrows of the Yorkshire Wolds.

The Rev. W. Greenwell read a description of the round barrows and their contents. In general form these barrows are either conical or bowl-shaped. It is probable that many had originally an encircling mound or a ditch, or both, at the base; but if such were the case, all traces of these enclosures have been destroyed. The barrows were constructed of the materials nearest at hand, more commonly of earth than of chalk. They are usually associated in groups, but a single barrow is not uncommon. As a rule they have been erected on high ground. The bodies buried under the mounds occur at various levels, the centre burial being usually in a grave excavated in the chalk. Generally, there is nothing to protect the body from the pressure of the overlying soil, interments in cists being almost entirely unknown in the wolds. Rarely the body has been protected by a coffin formed of a hollowed tree-trunk. The remains of the body, when burned, are sometimes enclosed in an urn. Secondary interments are common, and the bodies previously buried have been thereby disturbed, and the bones scattered. In some instances the burials were by inhumation, in others after cremation, the former practice being by far the more common in the wolds. In cases of burial by inhumation, the unburnt body is always found lying on the side in a contracted position, with the knees drawn up towards the head. This was evidently not due to the requirements of space, but must have originated in some settled principle, the meaning of which is not understood, but which appears to have been common

to all mankind at a certain stage of development. Perhaps it was in imitation of the natural posture assumed in sleep when the individual sought warmth. The direction of the body seems to follow no rule.

The barrows contain numerous weapons and implements of stone (including flint), of bronze, and rarely of bone or horn. The catalogue of stone implements includes almost all those which occur elsewhere, but the bronze articles are very limited. In 248 burials by inhumation and after cremation thirty-nine had articles of flint or other stone, ten of bronze, and three of horn. From the evidence afforded by the barrows it appears that the early inhabitants of the Yorkshire wolds must have lived in an organised state of society; that they possessed domesticated animals, and cultivated grain; that they manufactured woollen and perhaps linen fabrics; and that they had attained considerable skill in metallurgy, and were acquainted with the manufacture of pottery, though ignorant of the potter's wheel. It is believed that it was their custom to bury with the dead the wives and children of the deceased, and perhaps their slaves. The round barrows yield both dolichocephalic and brachycephalic skulls. The short-headed race were taller, more strongly built, and harsher in features than were the long-headed people. With regard to the age of the round barrows, the author feels safe in not attributing to them too high an antiquity by referring them to a period which centres more or less in B.C. 1000.

THE NORTHAMPTONSHIRE EXCURSION.*

An early train from Stamford brought our party to Elton, on Wednesday, the 21st, to commence a round of churches in the district adjoining Oundle. Of these Fotheringay, the first visited, is a very fine example of a large spacious church entirely in the Perpendicular style, with a tower crowned by an octagon lantern of very stately character, and forming an exceedingly fine object as seen from the south-east and north-east. The large deep buttresses externally, and the peculiar thin flying buttresses to the clear-story, are well worth attention as a piece of good and effective building; and the west doorway is one of the best specimens of the style. The church has no chancel, an omission which gives a very peculiar character to the interior. The broad walk up the church, overshadowed by a complete continuous "pointed vault" of foliage, through which the sunlight made an intricate diaper on the path, was not the least pleasant feature in connexion with Fotheringay. The tower and spire of Warmington, our next halting-place, are well known as one of the finest specimens of the Early English period: the scale is small, however, and the proportion of the spire somewhat broader and shorter than most of the said illustrations would lead one to suppose. The inspection of this and some other well-known spires will confirm the opinion we have expressed on a previous occasion as to the inaccuracy, especially in regard to general proportion and outline, of Wickes's illustrations, from which many students have taken their idea of the structures they were unable to visit. The roof-shafts at Warmington (which carry a wooden vault of simple design) have remarkably beautiful carved capitals, which have not yet been illustrated. Tansor, with its short tower covered thickly with ivy, is a small unpromising-looking structure externally, possessing, however, no small interest, and comprising specimens of nearly every period of English architecture. The older part of the nave-arcades, towards the west is Early Transitional of a very good type; the church was remodelled in the Early English period, and the nave lengthened in that style. The most singular point in the church is the continuous rise of the floor from west to east, making a difference of nearly 2 ft. or thereabouts in the levels; the capitals of the nave arcade, though very irregular, diminish in height, in the main, in the same direction. Was this one of those odd attempts at artificial perspective, specimens of which are to be found here and there on the Continent? More likely it was accident, or carelessness. Proceedings were diversified here by some organ-playing by a member of the party, on a small but remarkably pleasing instrument by Walker, of London; winding up with a certain prelude and fugue of Bach, dear to musicians as "the little E minor" (as distinguished from the "big" ditto). Cotterstock, to which we next find our way, is a small church, notable chiefly for a fine east window; also for a bit of flat *fleur-de-lis* cusping in one of the tower windows, unusual and very modern-looking in appearance, though evidently old. Here we lunch under an avenue of trees, assisted in our operations by the hospitality of a genial old farmer of the place, who insists upon bringing out to us mighty flagons of "home-brewed" from his own stores—such material as is not to be had from the degenerate taps of town inns, large or small. We give our hearty old friend three cheers, and drive off in a state of mind to do justice to the beauties of Polebrook. This small out-of-the-way church is one of the finest and most interesting of our series. The church is Transitional and Early English, of the finest types; it is nearly square on plan, being only three bays long, and having nave and aisles, and a north transept of considerable depth, the width of the eastern bay. The arcade of the north side is rich, but comparatively Early Transitional work, the south side later, approaching to the fully-developed Early English style (to which the tower and spire belong). The north transept contains one of the most beautiful and artistic specimens of an Early English wall arcade that could be seen. The beauty and variety of the nave capitals is also remarkable. No one coming to the neighbourhood should omit a visit to this church (about two miles eastward of Oundle), on account equally of its detail and general plan and arrangement, which are alike most suggestive. Barnewell St. Andrew, two miles farther south (for we are progressing down the eastern side of the county now), is a small church, the chancel at present under "restoration," which, in this case, nearly includes rebuilding; style, mostly Early English, remarkable for the profuse use of the "dog-tooth" ornament; also for a door in the west tower, calculated to puzzle archæologists, and which was set down by some of the party, our leader included, as a seventeenth-century attempt to imitate "Decorated" work. Are we quite in a position, by the way, to say, whenever a bad and clumsy piece of work is found, that it belongs to the modern period? There might have been clumsy masons even in the fourteenth century,—exceptions to the rule,—or perhaps amateur architects. From hence to our next rendezvous, Tichmarsh, is a beautiful drive of about four miles; and perhaps it would be difficult to find anything more pleasant or more thoroughly English in character than the main road at this point, with a wide border of turf on each side, lofty thickset hedges, and over them an almost unbroken row of fine tall trees overshadowing the road, and screening the sunlight just enough to make the effect perfect. The church at Tichmarsh is altogether modern internally, and good work, containing also an organ by Mr. Lewis, which, so far as it is finished, fully confirms the reputation which this rising builder is already establishing. Architecturally the point of interest is the tower, of late date, the lower portion of which, with its deep buttresses and rich profusion of quatrefoil panelling, in excellent preservation, is a remarkably fine piece of work. Here we are entertained with tea and coffee, on the rectory lawn, under the shade of a great cedar-tree, celebrated for its size and beauty, and opposite to the garden front of the new rectory, a most pleasant bit of domestic building by Mr. Browning, of Stamford, whose good work and true feeling for his art we have had several times occasion to recognise in the course of our excursion. From hence we take train to Oundle, find our way over the long bridge which forms the approach to the town, and charge the Talbot Inn in great force. This is a picturesque old house, worth a note in itself, particularly the solid old staircase leading up to the dining-room, and lighted by mullioned windows, looking out into the courtyard, and the long, low room, with its two large, fine stone fireplaces, belonging, like the staircase, to the Jacobean Renaissance period; and it is only justice to add that the fare and the attendance were equally of the good old-fashioned kind, and that plenteousness and civility went together. After dinner arrangements were entered into for obtaining photographs of some of the places visited during the day, the objects to be photographed being put to the vote by a show of hands. Then came a turn-out to the church, obligingly lighted up for our inspection. More organ-playing here, to an extensive congregation, winding up with a general hymn-singing. As to the church, the interior has been well restored, but is not remarkable, except for size. The upper stage of the tower is one of the finest bits to be found in the kingdom, very unusual in design, and was one of the objects almost unanimously selected for photographic illustration.

Half-past seven the next morning found us, by train, at Thorpe Station, five or six miles south of Oundle, whence (after first losing our way and being deposited in a *cul-de-sac* in the churchyard of Lifford-cum-Wigsthorpe") we found our way to Aldwincle, of which the older church, St. Peter's, is well known, from illustrations, for its beautiful simple tower and spire of Late Decorated date. The later tower of All Saints', less known, deserves to be more so, as a remarkably good example of Early Perpendicular work, unusually artistic in design in the upper stage, and notable for a treatment of mouldings and details in which a good deal of the richness and well-rounded relief characteristic of the Decorated period is combined with the forms and general treatment of the later period. As a specimen of masonry this tower is admirable. In this village Dryden was born; tradition says, in the house now the Parsonage, but this, as the spectator said, "wants confirmation." The name of the author of "Absolom and Ahitophel" certainly suggests associations curiously at variance with the aspect of this quiet, retired country village. A drive of a mile brings us to Lowick, a church entirely in the Perpendicular style, and with a tower and lantern not without merit, but the whole thing is weak and wiry. In the church are the chapel and some monuments of the Sackville (Lord Dorset) family, and a rather singular monument, having two recumbent effigies with canopies at their heads placed horizontally; the back of the canopies decorated with small and delicate panel-work. Islip also is a late Perpendicular church, small, with a pretty spire, but not otherwise interesting; but our next stage, Woodford, is a somewhat notable church. There is here what may be termed a double chancel arch, one in the usual position, and one three bays to the westward; both arches of the same date in regard to mouldings, &c., and apparently built together. At the point where the western arch occurs are two transverse arches across the aisles, balancing the thrust of the centre one; the south aisle has three such cross arches from pier to south wall. The chancel, even beyond the eastern arch, is an unusually long one. The north arcade of the nave is Transitional work, of unusual interest,—the capitals mostly advanced to a tolerably high state of ornamental elaboration, but the arcade having perfectly plain semicircular arches, with a square soffit. The south doorway is exceedingly rich in decoration, and contains in the arch-mould an under-cut stem-and-leaf ornament curling from one member to another across a deep hollow, the tenuity of the stem here seeming more like what would be suitable for ironwork: that it should have remained, since the fourteenth century, almost unbroken and perfect, shows that the stone must have been very carefully selected in the first instance. On the whole, Woodford is a church which will repay study, both as to detail and general treatment.

Ringstead is a church with a fine spire of Early English date, remarkable for its breadth and simplicity of treatment; there is a fine arcade of the same date, with the singularity that the capitals (moulded only, without carving), are of different heights, some shallower than others. It is a small church with nave and north aisle only. But Ringstead is noticeable as the first church in our series, as we go southward, in which we find the suggestion of a constructive polychromy, very largely used in many churches in the southern part of the county, by the introduction of bands of the dark reddish brown iron-stone which forms a large part of the geological formation of this portion of Northamptonshire. In the present instance the use of the red stone is oddly partial and irregular; here and there a voussoir, or a band in the middle of a pier; in another place a whole pier composed of it, &c. But as we proceed, and come into the centre of the iron-stone district, we find this introduction of the iron-stone in contrast with the grey oolitic limestone, more and more common, and carried out with increasing regularity; forming the keynote, too, of several modern restorations. One cannot help noticing, indeed, when going rapidly in this way from one group of churches to another, the manner in which the design of the buildings is coloured, so to speak, by the nature of the formation on which they are built; a relation between circumstances and results of course much more pronounced in

* See p. 660, *antè*.

times when transit was slow and difficult than in these railway days. Indeed, the remarkable range of fine churches which runs through Lincolnshire and Northamptonshire might almost be described as the outgrowth of the lias and great oolite deposits which are laid bare at this part of England, and furnish the main portion of the magnificent building stone which enabled the Mediæval builders of this neighbourhood to construct such beautiful and enduring works. Where these formations crop out there are the best churches; where they disappear the churches, as a rule, decrease in interest. This connexion of works of art which are comparatively only the productions of to-day, with the formation of deposits of clay and minute shells countless ages ago, suggests matter for many reflections, which yet we will not follow out here, but go on to Denford Church, only noticeable for its picturesque situation, a pretty spire, and the existence of some of those pots built into the wall in the chancel, the discovery of which gave rise to much speculation some years ago, and which were said to have some acoustic object, a suggestion pretty generally given over to contempt by our party. Indeed, it is not easy to see what acoustic object they could fulfil; though it is credible that the Mediæval builders may have had some unfounded fancy of that kind. We next proceed to Raunds, with its famous tower and spire, grandly situated at the crown of a steep field, from which an excellent view of it is obtained. This tower has been a good deal illustrated, but mostly very inadequately, and must be seen to be properly appreciated. It is worth noting how fine is the contrast between the rich treatment of the tower, with its multiplication of buttresses and set-offs, and the plain masonry and long lines of the spire, broken only by comparatively small lucarnes. The disproportion between the size of the church and its tower is remarkable even now, and must have been much more so before the present late clearstory was added, and when the church was comprised within the limits shown by the weather-mark visible on the east wall of the tower, within the church. Clearly utilitarian theories of building were not predominant when this tower was built. With this feature the interest of Raunds, to the architect, begins and ends; the church is tame and poor in design, and in wretched condition; dirty, dilapidated, fitted with wretched worm-eaten pews; the south wall of the nave and aisle bulging to a dangerous extent from the spreading of the roof: unless something is speedily done the building will be unsafe. The manners of the natives, who, in a dirty disorderly crowd, followed our party into the church, seemed to match only too well with the state of the village sanctuary. We do not pretend to say whose fault it is, or whether there is any fault in the matter, but certainly Raunds leaves a melancholy impression, or depression, on the spirits, as of a place morally and materially neglected. The little church of Stanwick, with its octagonal tower almost unique in design, is the last on our day's route. The situation of the church on the side of a descent, and surrounded with trees, is most picturesque, and would make an excellent subject for an artist; the only particularly noteworthy thing in the interior (which has one aisle only, on the south side) is the singular niche just within the chancel, behind the north front of the chancel arch, and facing to the east, the use or origin of which it is difficult to conjecture. A drive of six or seven miles brings us to Wellingborough, where we are to stay the night; a place soon to become, probably, the centre of an active ironworking district. We come here fairly on to the iron-stone formation; instead of the grey limestone road, we have a dark red dusty highway, unpleasant to the eye, and the inevitable disfigurement of the face of the country by excavations, furnaces, chimneys, and other such defilers of the landscape, has already made some progress. The strange point, indeed, is that the richness of this district in iron should not earlier have been noticed and turned to account; and that stone should have been used for building in the churches of the district nearly 500 years ago, with the iron seams actually cropping out from the worked face of the stone (as may be noticed in the external walls of many of the churches in the south of the country), so that it can be filed off; and yet that it should only have occurred to people within a few years back that it might be put to a more remunerative use than building with it. Whether the "wealth" of a district, in every sense of the word, is promoted by this kind of tillage of the soil, may be questioned; but the fiat has gone forth, and the iron industry will, no doubt, be more and more actively cultivated in Wellingborough and the neighbourhood for some time to come. The town itself, never, we should fancy, a very interesting one, has already begun, in its newer portions, to put on that look of unutterable ugliness and grimness which appears the inevitable aspect to which towns come that take to iron manufacture,—an industry before which, under whatever form, beauty seems to fly from the face of the earth. It must have been of the ironfounders that the prophet said, "The land is as a Garden of Eden before them, and behind them a desolate wilderness." Let us hope there is solid good enough to compensate for these inevitable evils, but one is sometimes tempted to doubt it.

The church at Wellingborough, of which we saw the interior by gas-light only, is a fine, spacious building, mostly of late date, and well and carefully restored recently by Mr. Law, of Northampton. Some remarks on what was noticed in the churches in the immediate neighbourhood of Wellingborough and Northampton we defer.

THE VIENNA UNIVERSAL EXHIBITION AND THE WORKING ARTIST.

According to all report, what has hitherto been done in the way of exhibitions will be far excelled by that which is to fill the world's eye in the forthcoming year. We, of course, refer to the "Vienna Universal Exhibition," now in active course of maturing itself, both here and everywhere else. A few words about it in time may, we think, be useful. We have before us the general and very comprehensive *programme*, almost a comfort to see; for so much has been thought of, and methodically put together and arranged. The whole idea is under the highest possible patronage,—that of his Imperial and Royal Apostolic Majesty, the Emperor Francis Joseph; its president is the Archduke Regnier; and its general manager, the Baron William de Schwarz-Senborn. It would seem impossible for things to be more promising. The city of Vienna occupies a commanding, and in some respects a *unique*, position in Europe; and is, *in itself*, not a little remarkable in many ways. The building will be about *four* times the size of the Exhibition building of '51, and is situated in the "Prater," or Imperial Park, and close to the Prague or Northern Railway Station, and almost on the banks of the Danube, which runs through the city. Nothing can be better. It is impossible to speak of Vienna without noticing the singular way in which these modern days have *added* to the old Middle-age city which stands in the very centre of it. It is about *three-quarters* of a mile across, and in it is the Imperial palace, and the renowned church of St. Stephen. This inner town is entirely *surrounded* by a broad garden or park, in which no building has very properly been suffered to be built. It was the ancient *moat* of the city in its old and fortified state, so that you must cross this ancient moat site and present garden to pass from the new city into the old, or garden-surrounded city. Old Vienna is thus completely surrounded with a ring or circle of trees and flower-beds! The new or modern city has another or larger ring surrounding or encircling this. It is a singularly happy idea, though an accidental one, and says much for those who would not allow of its green spots being built on. A good deal more might be said about this city and its "improvements," for *improvements* are not confined to London or Westminster, but our present business is to hint at a thing or two concerning the *artistic* part of the coming Exhibition: as we take it, a not a little important part of it.

In the first place, it will be seen by referring to the programme, that the classification adopted for the objects to be exhibited are separated into twenty-six classes or groups, as mining, agriculture, chemicals, and so on, for raw produce. Then metal industry, wood industry, stone, earthenware, and glass, and so on; for manufactures and art-manufactures. There is also under this heading, art as applied to religion, *i.e.*, works of fine art which are employed in public worship. There are also to be fine arts of the *past*, and fine arts of the *present*. There is also "education" as a matter of course, and teaching and instruction, so that there is as it would seem really nothing left out. We say nothing of trials of machinery, history of industry, conversion of "waste into use," history of prices, and a perfect host of other things sufficiently puzzling to the curious, however curious they may be; but one thing certainly has been left out of the programme, at least, which has always seemed to us to be all-important; and it is this—in a single phrase: *artistic hand-work*, as applied to common things. We do not here mean pictures, or even statuary, or expensive engraving, but simply that sort of work of which the old Etruscan, or the old Greek, has left us specimens in his wonderful vases and wine-cups, and of which old Rome and Pompeii have shown us examples in their wall paintings, and which the dark Middle Ages managed to accomplish without the aid of machinery or apparatus, in almost every fragment of wood carving, or stone-cutting, which time has spared to us. Do not let us be misunderstood. We are not at present complaining of art-manufactures, though it is a painful subject to contemplate, for we all know before hand *who* they are, and must be, who will carry off all the prizes of this great show; but we are simply again asking attention to the fact of the existence of those artistic hands which are, however things are done, destined to do the real and actual work. What we want and are pleading for then is, a small space, in this gigantic show, for the modern successors,—for some few, at any rate, actually do exist, though at present unknown,—of the old Etruscan, the fine Greek, and the workman, and the working artist, of the Middle Ages. We all know well what it is that we shall see: the huge and well-filled glass cases elaborately fitted, and lined, and labelled in full with the name and antecedents of the exhibiting firm, names and addresses, and all complete, triumphs of energy, and organisation, and capital! But of the very names of the men who, in some obscure corners, garrets, or cellars, who have painted, or even helped to paint, or to mould the costly tea-cup, or fruit-plate, or drinking-cup, or anything else you like to name, who is there who expects for a moment to see them either stuck on to the objects made or adorned, or anywhere else? On very many of the *antique* vases there is the name of the executive workman, or artist, and we almost seem to see the man as we look on his work. It is rude work enough, some of it, it must be confessed, but how expressive of the country in which it was done, of the race of men who so wrought, and, what is even more, of the individuality of the executive workman. It is something of this that we want to see in the Vienna Imperial Exhibition of next year. We want to see exhibited in it, not merely whole cases full of goods, the produce of organisation, and capital, or miles of designs in artificial stone, but at least a *corner* of the great building filled with the works and names of individual artist-workmen. Each country from Scandinavia to Italy, and from Russia to France, having its representative workmen. We must repeat, do not let us be misunderstood. Of course, the workman or workmen must always be seen in some way or other, nothing comes into being of itself, and a modern painted and drawn and designed tea-cup, or cheese-plate, is the produce of some one set of men or machines. It is impossible to get entirely rid of the personality of the workman, and this is, of course, a something; but as we have said, but must repeat, what we desire to see is,—the man, not as a mere workman, or even as an artist, and as producing a result *with others*, but as an individual artist-workman. It would be impossible to over-estimate the importance of this mode of exhibiting to the world the capacity and skill of the modern workman, no matter what may be the *range* and power of his artistic capacity and skill. If he have the very highest, as that of a painter, then we must see it, if it be only to wonder at it. If it be the lowest, it must possess the same interest as is always to be found in a man's handwriting, however rough that may be.

We have said there are twenty-six distinct groups of classified objects comprehending almost everything, might not there be yet another, an artist-workman's group, for the express purpose of exhibiting the artistic power of Europe as embodied in its individual workmen? Such a division would be of surpassing interest, not only to general visitors, but more than all to those who are given to think of the future of the workman; and certainly to all those who really care and know anything of the "education" of the working man: for the best and most productive of education must be that which adds to the mental and bodily powers and producing capacities of the workmen of the time. It is not surely as a mere show of novelties, and as a

gigantic advertising medium, that this great Exhibition is to be made useful and salutary, but as a great and comprehensive way of finding out *what* Europe can do, *i.e.*, what its thinkers and workmen can accomplish. The capitalist helps such, and the shopkeeper distributes what they produce, but surely they should not *hide* altogether those who do the actual work itself, that work, indeed, which the whole world is invited to go and see, and to admire and talk about. What then can the Imperial Commission do better, and more to the purpose, than take these working men's thoughts into their consideration. Now is the time for it.

There is yet one other point we would notice appertaining to this coming Exhibition, and, to our minds, a very important one, and it is that of a sincere hope that we may see in it some good sign of not only the *individuality* of the working artist, but also of the "individualism" of the country from which he may have come. Though each European state sends artistic and other objects professing to be characteristic of it, and to be brought into existence by its own language-speaking people, still these objects, strange to say, are not peculiar to it, either in style of art or otherwise, but are, as it were, common to Europe *generally*. They are "western" productions, to use a more general and now somewhat fashionable phrase, and are for the most part all of them most painfully alike. They may be, and indeed they are, by men of different nationalities, as they are by different workmen; but they are *not* representative of the different national art instincts which we must suppose to exist somewhere in each separate European country. How, may we ask, is this? Is all Europe coming to one style of art, and method of workmanship?—all its different nationalities producing one set of objects, whatever they may be for, and of one uniform type and make, and system of manufacture? And if so, and it looks like it, is it a gain, and a sign of "progress" and "improvement"? This fusing of all countries and arts into one, so that to be in one place is practically, as far as art goes, to be in all, is much to be regretted. Let us cite in this place but one instance of this: the ordinary and common *costume* of the time. Why all Europe, north, south, east, and west, is fast coming to the machine-cut coat and its inartisic belongings. The time was when each country had its costume, and in *pictures* we yet see glimpses of the strange-looking world which made up the Europe of past days! In old, and past, and unmechanical, and unprogressive days, the Venetian to wit, looked like himself, and no one else. The stout Dutchman had a build of his own, and the old Muscovite certainly did not ape the dress of a Frenchman. To pass from one country to another was like going into a new world of art and of manners and ways of life—a new creation at every turn. But all is changing. Europe is progressing; but may we not well ask, in all curiosity, to what is it progressing, and where is the fountain-head of it? Could not the coming Vienna Exhibition throw some light on this curious problem. In the very centre of Europe all things might converge, and the light so brought together would be seen everywhere.

THE ST. PANCRAS HOTEL.

The Midland Railway Company have determined to carry out the completion of their magnificent hotel in connexion with the St. Pancras Station, to the full extent of the original design of Sir Gilbert Scott, the architect. This was agreed upon at the half-yearly meeting of the company last week, when the hotel formed a prominent question of discussion. The hotel is considerably advanced, but during the last two years a large portion of the western elevation of the building has been, to a certain extent, in abeyance. The financial and railway difficulties of 1866 led the company to decide upon finishing the hotel upon a scale considerably reduced from that originally submitted by the architect, and the building has since proceeded upon special votes of the shareholders, from time to time, every effort having been made to provide a suitable structure, giving adequate accommodation upon a reduced scale. It now appears that the concurrent testimony of practical men is adverse to the success of that experiment, and the directors of the company state that they find it difficult to refute the arguments of those who contend that it would be inexpedient to mutilate the original design. They further state that, having regard to the rapidly increasing traffic of the company, and the probable extension of the Midland system into Scotland, it would be unwise to limit the accommodation at their principal London terminus; and they add that, even supposing it could be urged that the original design was somewhat in advance of their requirements at the time, every day that passes is curing that defect.

In the course of the discussion on the subject at the meeting in question, the chairman paid a graceful tribute to the architect. "It has not," he said, "been the practice of the Midland Railway Company to lavish much of its money on works of art, and I am quite content that this matter should be treated exclusively upon commercial grounds. But since there are so many arguments in favour of the completion of the building more in accordance with its original design, I cannot forbear to add that every artistic consideration also pleads in favour of such a treatment of this building as will render it worthy of the great artist whose work it is, and of the great company whose name it bears." The chairman then intimated that unless the meeting, by any clear expression of their opinion, forbade them, the directors would consider that the shareholders left the completion of the building, henceforth, entirely in their hands. The shareholders at the meeting, by a unanimous vote, gave the directors the powers they asked for, and the hotel will now be completed in accordance with all the magnitude contemplated in the original design. The entire cost of the structure is estimated at upwards of 220,000*l*. About 122,000*l*. have already been expended on the building, and to finish the hotel according to Sir Gilbert Scott's design, a further outlay of from 90,000*l*. to 100,000*l*. will be required. The extended works are to be proceeded with at once, the company being anxious to have the hotel completed as early as possible, in anticipation of the opening of their direct line to Liverpool, and also the opening of the Settle and Carlisle line, which will open up communication with Scotland.

THE NEW WORKMEN'S DWELLINGS IN EBURY-SQUARE, PIMLICO.

The second block of buildings which have for some time been in course of erection in Ebury-square, Pimlico, by the Improved Industrial Dwellings Company, are now almost finished, and ready for occupation. The first block was opened about twelve months ago. The second block, now in progress, is on the north side of the square, the chief entrance being close to the Grosvenor Working Men's Club, at present in course of erection. A wide staircase leads to the several stories above the ground-floor of the building. There is a large area or courtyard within the block, which contains six stories on the side looking into Ebury-square, and five stories on the other side, and at the end. Ornamental iron balconies run round the entire block, at the front of each story, protected by iron railings, between 3 ft. and 4 ft. in height; and from these balconies access is gained to the several dwellings, which are, altogether, sixty-four in number, some of them having two, whilst others have three and four rooms each. Attached to each dwelling are separate domestic conveniences, every tenement having its own scullery, containing copper, sink, coal-place, dust-shoot, and other necessaries.

There is a kitchen range in each dwelling-room, although the stove in the scullery is easily capable of being converted into a cooking apparatus. Some of the larger rooms are 13 ft. 8 in., to 13 ft. 11 in.; the bedrooms are 8 ft. by 6 ft., and 9 ft. by 6 ft., the uniform height of the rooms being 8 ft. 3 in. The ventilation of the premises is effected by means of a ventilator placed in the ceiling of each room, which communicates with air-shafts running through the centres of the blocks. Drainage is thought to be secured by pipes passing from the top of the building down into a large syphon trap, with an up-cast ventilating pipe, and from the syphon trap direct into the main sewer. Covered receptacles at the base of the building receive the dust passing down through the dust shaft, each shoot being provided with an iron cover to prevent the escape of dust. The block has a flat roof, with an iron railing running along the edge, which serves for drying purposes; the railing being alike for the use of all the occupants of the building. The rents range from 1s. 3d. to 2s. 3d. per room per week, which includes rates and taxes, and water and gas supply. The block will be finished and ready for occupation in about a month, and there are already a great number of applications for the several tenements. The builders are Messrs. M. Allen & Son, Tabernacle-walk.

We understand that the company are about to build three more blocks, two of which will be in Commercial-road, Whitechapel, and the third on a piece of vacant land at the corner of Blackfriars Bridge. The Marquis of Westminster has also offered another site in Pimlico, which the company have determined to purchase.

RAILWAY STATIONS.

Sir,—The railway companies cannot, as a rule, be charged with want of public spirit in the matter of making their stations worthy the position they occupy as public buildings in the metropolis. Many of them are ornaments to the neighbourhood in which they are situated, and alike creditable to architect, builder, and railway company. How comes it, then, that when these companies meet, as at Clapham Junction, there seems to be an entire absence of any desire to make the station either respectable in appearance or comfortable in accommodation? At this, the largest centre of passenger traffic in the kingdom, one would expect to find a building or series of buildings worthy inspection, calculated to please the artistic, and make tolerable the time, now felt by many so irksome, which they of necessity pass at this compulsory resting-place. The time of waiting cannot always be counted by minutes; and were the immediate neighbourhood inviting for a ramble, the weather is not always so, and the gloomy platforms and waiting-rooms are the only competitors with the refreshment-bars for the favour of your company.

Is not this station patronised by the public to an extent that they have a right to call for more consideration on the part of the railway companies?

That railway passengers often pass a considerable amount of time at our various stations seems to be little thought of, and that they have minds which might be improved during their stay seems to be thought even less of,—the one solitary instance being that of the Religious Tract Society, whose publications meet us at the various waiting-rooms on all lines. Surely a great good would be accomplished if many other societies would "go and do likewise,"—such societies, for instance, as the British Association. Many a half-hour would thus be rendered pleasant, and the presence of such publications at places so frequented as railway-stations could not fail to have some influence on the moral and intellectual power of the nation.

Mark H. Judge.

HATFIELD CHURCH, YORKSHIRE.

The church at Hatfield, near Doncaster, of which the restoration was inaugurated on the 8th of last month by the Archbishop of York, is seldom visited and little known even by those who are interested in architecture. The village in which it stands is now a remote and decaying place, and to many it will be a surprise to hear that there is another Hatfield besides the one in Hertfordshire, whose church was restored and reopened the other day. Yet Hatfield in Yorkshire was once a place of consequence, the habitable centre of a wild and desolate district of moor and mere, the mother church of several surrounding parishes, and a royal demesne. It is first mentioned in Bede's account of the battle fought *in campo qui vocatur Hethfelth*, by Edwin, king of Northumbria, a convert of Paulinus, against Cadwallo, king of Wales, and Penda, the Pagan king of Mercia, A.D. 633, in which Edwin was slain. In Domesday Book, Coningsburgh and Hatfield are said to be held by Harold. Hatfield formed part of the immense possessions granted by William after the Conquest to William de Warrenne, and it remained in the ownership of his descendants till A.D. 1349, in the reign of Edward III., when it became royal property, and was settled on the princes of York. When they ascended the throne, it became a demesne of the crown, and the hunting lodge at Hatfield was dignified, says Hunter ("History of the Deanery of Doncaster") by the name of palace. It could not, however, have been a building of much pretension. Leland describes it as "meanly builded of timber." Two writs of Edward III. are dated from Hatfield, and his second son, William of Hatfield, who died in infancy, was born here.

The great attraction of the district to the De Warrennes and their royal successors seems to have consisted in the famous "chase," and the sports to be found there. The level of Hatfield Chase comprised in extent an area variously estimated at from 70,000 to 180,000 acres, according, probably, as more or less of surrounding moorland was included in the computation. Until the seventeenth century it was little cultivated, and it swarmed with deer, swans, and wild fowl. Nearly half of its extent was under water a great part of the year, and there were always several large meres abounding with fish. One of the largest of these meres lay between Thorne and Hatfield, and by its overflowings, probably rendered communication difficult between the two places, for one of the arguments by which the people of Thorne, which place was at first a chapelry of Hatfield, supported a petition for their constitution into a separate parish, was that it was impossible at certain times of the year to take their dead to Hatfield to be buried. In 1356 Edward Balliol, in sporting over Hatfield Chase, made what would be thought a fair bag even in these days, consisting of 16 hinds, 6 does, 8 stags, 3 calves, 6 kids. In the park he killed several head of game; and in the ponds, 2 pikes of 3½ ft. in length, 3 of 3 ft., 20 of 2½ ft., 20 of 2 ft., 56 pickerels, 109 perch, roach, tench, and skelys, and 6 bremes and bremettes.

De-la-Byme, who lies buried in Hatfield Church, has recorded a day's hunting enjoyed here by Henry, Prince of Wales, A.D. 1609. Charles I. sold these barren moors and lakes to Cornelius Vermuiden, a naturalised Dutchman, to drain and cultivate. Since that time the waste land has been gradually reclaimed; the meres have disappeared, and good roads traverse what were impassable morasses. Yet there are still close to Hatfield vast tracts of unreclaimed moor, where the rider may suddenly find his horse sink under him to the girths, and which suffice to give some idea of what the whole district was before the enterprising Dutchman undertook to improve it.

The church, from its great size and imposing design, may fairly be called a magnificent building: it is cruciform, with nave and aisles, transepts, chancel with spacious side chapels, and a lofty central lantern tower. The west doorway, with its receding orders and shafts, is a fine though simple example of late twelfth-century work, and the south entrance belongs to the same date. The nave arcades are of a vigorous Transitional character, and very finely designed. (In the neighbouring church of Thorne the nave arcades are so precisely similar to these in detail that one cannot but suspect they are designed by the same hand.) Nothing more remains of the early church except the massive substructures of the four piers of a central tower which occupied the same space as the present tower, proving that the church was as large in the twelfth century as it is now. The north aisle of the nave was built in the fourteenth century, and contains several good windows of that date. This aisle is remarkable for the arches thrown across it to support the nave arcade, which even at that early date had begun to settle northwards: they rest outward on massive piers outside the church, and inward on half piers built against the inclined columns of the nave arcade. The other parts of the church, together with the nave roof and clear-story, were built in the fifteenth century, and all at one time with the exception of the handsome side chapels of the chancel, which are slightly later than the rest. The other fifteenth-century work, constituting, in fact, the greater part of the church, is very interesting from the fact that the whole of the tracery is formed with semi-circular-headed, uncusped, openings,—a kind of work that occurs elsewhere in the south of Yorkshire, but is believed to be peculiar to that district. The date of several examples is known with tolerable certainty, and falls within the latter part of the fifteenth century. The date of that at Hatfield is fixed approximately by the arms and crest of "Savage," which appear on the tower. Hunter identifies these arms as those borne by Sir Edward Savage, who was in great favour with Henry VII., and was made keeper of the park at Hatfield and master of the chase. His brother Thomas, who also was a great sportsman, was afterwards promoted by the same king to the Archbishopric of York A.D. 1501. This brings the date of the Perpendicular work at Hatfield down quite to the end of the fifteenth century, and suggests that the splendid restoration of the church at that time is due to Sir Edward Savage, then master of Hatfield Chase.

The chancel is separated from the nave by a sumptuous rood-screen which still retains its loft, and the bracket and mortise for the rood. The character of the work is extremely late, and the ornament with which the posts and panels are covered, although retaining the forms of Gothic tracery, is executed like Elizabethan or Jacobean work by merely sinking the pattern from the flat surface of the wood.

The church contains several other objects of interest. There is a huge "*Peter's Pence*" chest hewn out of a solid tree trunk, and banded with immense straps and clasps. Several pieces of armour hang on the walls, dating apparently from the civil wars of the seventeenth century; and there is a volume of Jewel's works, printed half in black letter and half in Roman character, and chained to an oak desk.

The restoration which has just been carried out, under the direction of Mr. T. G. Jackson, of London, architect, is anything but a complete work. The church is so large and the population so small, comparatively, that it has not been possible to raise enough money to do all that ought to be done. Still, much has been accomplished. Galleries and high pews have been swept away, whitewash and paint have been cleaned from masonry and woodwork, the whole church has been newly paved and floored and warmed, the greater part of the roof has been covered with new lead, and four of the nave piers have been underpinned and rebuilt, the superstructure being meanwhile carried on shoring. Low and open seats are provided for the congregation in the eastern part of the church, about half the nave and the whole of the aisles being left unoccupied, which adds much to the effect of the interior. The central lantern is restored to view by the removal of a modern ringing-floor, and thrown open to the height of 56 ft. from the pavement. The admission of a flood of light into the centre of the building by the four large lantern windows is not the least of the improvements that have been made. The eastern part of the chancel has a pavement of Messrs. Powell's opaque glass, and the rest of the floor between the seats is paved with Godwin's tiles. The glass for the east window is now being made from the designs of Mr. H. E. Woolridge by Messrs. Ward & Hughes. The warming apparatus was supplied by Messrs. Frazer, of London. Mr. Wood, of Doncaster, was the contractor for the general work.

THE SEWAGE OF BEDFORD AND IRRIGATION.

About five years ago the local authorities of Bedford decided to apply to irrigation purposes the sewage of the borough, and with the view of carrying out this principle they entered into arrangements with the Duke of Bedford and other landowners for the rental of land, on a twenty years' lease, situated about a mile and a half from the borough boundary, at Nuneham, the annual rental for this land being a little over 920*l.* A return has just been published of the expenditure and receipts on the irrigation farm since the commencement of the undertaking, which is of a highly interesting character as bearing upon the sanitary condition of the borough, and also as showing the fertilising effects of town sewage, and its powers of productiveness to the land.

It appears from this return that the outlay on the farm in engineering, machinery, farm buildings, pipes, labour, and other miscellaneous items of expenditure, amounted to the sum of 6,997*l.*, this being the sum necessarily sunk before the works on the irrigation farm could be practically commenced. These have now been in operation for a little more than two years, and the statistical return just issued shows the results. It appears that the average daily flow of sewage on to the land is 700,000 gallons, and that the cost of pumping this sewage, together with the farming expenses, including rent, rates, and taxes (which is the main item, amounting to 2,029*l.* 10s. 3d.), since the commencement of working the farm, amounts to 4,179*l.* 2s. 1d.; and that the receipts for the sale of crops are 3,072*l.* 15s. 1d., showing a loss of upwards of 1,000*l.*; but from the last-named sum 248*l.* must be deducted, being a portion of the proceeds realised from the crops produced, but which, owing to the defalcations of a former official, was abstracted from the receipts. The actual loss, therefore, of the working of the farm during a period of about two years, may, in round numbers, be set down at 860*l.*, or at the rate of 430*l.* per annum.

It is, however, admitted that the above returns can scarcely be considered as a fair test of what the land will produce when its cultivation is more fully developed, and when better markets than seem at present to exist shall have been opened for the sale of the successive crops; for at a discussion which took place on the subject at a meeting of the town council lately, it was stated that, although the appearance of the land and the crops upon it testified to the great value of town sewage for irrigation purposes, it was nevertheless the opinion of Mr. James Howard, M.P. for the borough, and head of the firm of the eminent agricultural implement manufacturers, and also that of several well-known agricultural authorities who had inspected the farm, that its cultivation was by no means perfect, and that under a more skilful system of farming than is at present adopted, a larger yield of crops might be secured. It was further stated at the same meeting that several wholesale dealers in Covent Garden, and also dealers residing at Birmingham and other large towns, who had visited the farm, had expressed themselves willing to enter into contracts for the purchase of the vegetables produced if they could rely upon a regular and successive rotation of crops. It is, therefore, by no means improbable that the Bedford Irrigation Farm may ultimately be made not only self-supporting, but actually a source of profit to the corporation. But even should these results not be attained, and the annual loss of between 400*l.* and 500*l.* a year on the working of the farm continue, it is a question whether, in the interests of the health and sanitary condition of the borough and the district surrounding, this sum would not rather be a gain than a loss; for, as one of the members of the council at the meeting in question observed, in answer to a suggestion that the farm should be given up and disposed of, "We must dispose of the sewage in some form or other, and the question is, whether the present mode of utilising it is not more economical than than any other plan would be. In whatever manner we get rid of it a certain annual outlay must be inqurred."

There is much force in these remarks; but a question of still greater importance arises, and that is, *How* is the sewage to be disposed of in the event of the irrigation-farm being given up? In all probability there would be no alternative but to pour the sewage into the river Ouse, upon whose banks the town stands; and what must be the natural result of this? The figures which we have given above show that 700,000 gallons of sewage per day are at present thrown upon the irrigation-farm, all of which might, under altered sanitary arrangements, have to find its way into the river. But this does not by any means represent the quantity of sewage matter which would daily pollute the Ouse, for during some years past and at the present moment building on a large scale has been going forward in Bedford, and the population is rapidly increasing, and therefore the quantity of sewage may be set down as considerably in excess of that indicated by the figures already referred to. Would it then be wise to exchange a system under which the sewage of the borough is turned to a useful account in the improvement of the soil, even at the most at a small cost to the rate-payers, for one which has about it all the elements for deteriorating the sanitary condition of the locality and impairing the health of the inhabitants?

THE ALEXANDRA PALACE.

It appears from the proceedings at the half-yearly meeting of the London Financial Association, just held, that they have expended 35,000*l.* in the improvement and development of the Alexandra Palace and the Muswell-hill Estate, including the construction of part of the railway and station, and that the remaining portion of the line will be constructed by the Great Northern Company, which will give direct access to it from King's-cross. The company states that by the spring of next year the whole of the works, including the branch railway from the Edgware-road, will be completed; and it is expected that this railway will not only develop the palace, but increase the value of the 1,500 acres of land around it. Referring to the Lord Mayor and the Mansion House Committee for the purchase of the palace, the report of the Financial Society states that, until they shall be made acquainted with the proposals of the Mansion House Committee, they are ready to treat for the *bonâ fide* purchase of the palace on fair terms.

The Lord Mayor requests us to correct the following paragraph, as being calculated to mislead the public:—

"*The Alexandra Palace.*—Mr. Gilbert Redgrave, R.A., is moving in the matter of the Alexandra Palace, and the design is to make the building a science and art museum, similar to those at South Kensington and Bethnal Green, with the additions of a concert-hall and theatre. The undertaking, to be successful, would require to have a constant succession of novelties; and it is feared that, if opened under the plan of the metropolitan authorities, as at present framed, such would not be provided."

"The movement recently inaugurated at the Mansion House," says his lordship, "has for its object the acquisition of the entire park of 500 acres and its preservation for ever for the people, as a fountain of health and a grand arena of wholesome recreation. If only 192 acres are reserved for the park, and the remaining 308 acres are covered with buildings, as is contemplated by the owners, these objects will be frustrated. The larger area of land would not only not detract from the efficiency of the Palace for amusements, but, on the contrary, would give greater facilities for the 'constant succession of novelties' which Mr. Redgrave is moved to declare as necessary for the success of the undertaking. . . . . If the plans which have been placed before the Lord Mayor are carried out, they will be not only attractive, but will confer vast moral and physical benefits on the mass of the people,—a matter of infinitely more consequence than the provision of a 'constant succession of novelties.'"

THE HARTLEPOOLS EXCHANGE AND CLUB-HOUSE COMPETITION.

Sir,—For the following two reasons your report and description of the *successful* design in this competition has caused us some surprise. Firstly, we have not received any official notice of the final decision of the directors; and, secondly, the directors to whom we have spoken upon the subject are not aware that a final decision has been arrived at.

Hoping you will in a future issue insert some further account of this competition,

One of the Premiated.

THE DESIGNS FOR THE WORCESTER GUILDHALL.

The Survey Committee of the Corporation, to whom it was referred to pronounce as to the award of premiums for the designs for rebuilding or reconstructing the Worcester Guildhall, have decided on recommending to the Council that the first premium of 100*l.* should be awarded to the design marked "Bakalum," subject to his giving a guarantee that he can carry out the work for the specified sum of 18,000*l.*, exclusive of the tower, sculpture, and enrichments shown in the exterior perspective; the second, of 50*l.*, to the one marked "Fiat Justitia," subject to the architect's guarantee that the expenditure shall not exceed the aforesaid limit. There are only two plans for reconstruction, and the committee state that, having previously reported that "Convenience" had not complied with the stipulations as to outlay, they therefore presume that the premium of 60*l.* must be awarded to "Vindex." The second premium for reconstruction (30*l.*) remains unawarded.

ABOUT REIGATE.

A resident in Reigate sends us a reply to some statements as to the condition of Reigate made recently through our pages. The general correctness of "Gargoyle's" letter has been affirmed by several other correspondents, and we are not disposed to print mere assertions in denial. We print the greater part, however, of the resident's letter:—

"Where did 'Gargoyle' find 'the rows of ill-built, draughty tenements,' in which 'the great unwashed' dwell? There are very few *rows* of buildings in the place, except in the two main streets, and these are occupied chiefly as business premises. Draughty, a number of the small houses may be, but not more so than usual, nor more so in comparison with the larger ones; neither do 'fevers frequently recur;' and though small-pox paid the town a visit in the early part of the year, I do not know what the mark is that it has left behind. It is the same here as everywhere else,—the lower the class of people, the more they crowd together in the houses for economy of rent, and the more careless they are in sanitary matters. When typhoid fever and small-pox were prevalent in London and other places, it made its appearance here, but it was chiefly confined to a few places where sanitary requirements were most likely to be neglected by the people; the other cases were suspected of being brought from thence to other parts of the place. The Local Board did *not* fine a man for building a house of tea-chests (which would be rather *shaky* even for very speculative builders), but for erecting a store-shed without having given the required notice, or deposited plans for the same; and I believe the tea-chests merely supplied the weather-boarding, &c.; and even this was at Red Hill, and not at Reigate.

'Many are asking how it is that for three or four years there has been no migration to Reigate, and that building operations have entirely ceased. Some attribute it to the heavy rates that the new drainage will make necessary, but is it not because the town has been left undrained until its fair reputation has been damaged? There are several tenantless villas, which have evidently been occupied: perhaps their late occupants have fled to a place less obnoxious to the olfactory organs.'

Had there been 'many asking,' it is very likely I should have heard of it, but I have not; and I think the stoppage of building operations (that is, other than for the owner's own occupation or investment, which still goes on) is rather due to the increase of the cost of labour and materials than to the reason assigned. There are other places around London where houses do not let readily, though the drainage and locality may be everything that could be wished for.

The Castle Grounds are a vast improvement on the old state of the place,—thanks to the liberality of the trustees,—and though 'Gargoyle' says more evergreens are wanted, perhaps if he waits until the present shrubs are grown up, he may see sufficient of them. There are plenty of seats, under large and shady trees and elsewhere, and although on one side more trees might be an improvement, these are not grown in a year. The trustees have spent more money than the subscriptions amounted to, and 'if the public would be drawn thither more than it is if 10*s.* or 1*l.* a week were spent in music,' I should think it is only fair that the 'public' should furnish the means by more of them becoming annual subscribers.

As to the letter of 'Salus Populi,' although some of its statements are unfortunately true, generally speaking it is apart from the subject. I believe there are fewer houses than usual in Reigate in which the 'speculating builder' has scamped his work to any great extent.

R. J. W."

The *Surrey Advertiser* has taken up the cudgels for the authorities, and terms the statements of "Gargoyle" and "Salus Populi" "calumnies" and "utterly unfounded." Our usually well-conducted contemporary will better fulfil its mission by helping to obtain for the town the attention and improvements that are needed. Reigate has many attractions and capabilities, and deserves to be cared for.

BEDS AND BEDSTEADS.

When the Hebrew writer wished to convey an idea of the might and prowess of Og, king of Bashan, the last of the giants, he said his bedstead was a bedstead of iron. In like manner, when Amos was inveighing against the wantonness of Israel, and desired to depict the height of slothful sumptuousness indulged in by those "who took their ease in Zion," he declared they lay upon beds of ivory. Again, nothing gave a better insight into the Spartan habits of the great Duke of Wellington than the small, uncurtained iron bedstead in his bed-chamber, in Walmer Castle. Thus, it will be seen, a man's bed has often been closely associated with his character, as well as with his fortune, from the earliest times to our own. This piece of furniture has, moreover, further interest.

Judging from Egyptian, Greek, and Roman bas-reliefs, beds appear to have been always furnished with mattresses and pillows, sheets, and counterpanes; but they have differed exceedingly in form and materials. The form was probably first affected by the discontinuance of the custom of reclining on couches at meal-times, which took place towards the close of the fifth century. Among the materials used in their construction from the earliest times, have been bronze, silver, ivory, horn, and rare woods.

M. Viollet-le-Duc, in his recent work on Merovingian and Carlovingian furniture, gives some interesting particulars concerning ancient French beds. Before the thirteenth century, there were so many cushions piled up at the heads of beds that persons sleeping in them reposed almost in a sitting position. In the vignettes of manuscripts of this period, we may see that people undressed before lying down, and draped themselves only in the ample sheets. Over them, as they lay propped up with pillows, was thrown a heavy counterpane, probably of tapestry. Sometimes another piece of tapestry was placed under the mattress, and allowed to hang down on either side of the bedstead till it touched the floor. M. le Duc gives a fac-simile of a *vignette* in a manuscript in the Strasbourg library, in which this arrangement is represented. A king reclines in bed, conventionally crowned and robed. The bedstead is of metal. At the head of it are two standards, one on either side, which support bars extending from one to the other, upon which one end of the mattress is raised. Thus the number of pillows in this instance is reduced to one, which is very small, and covered with rich stuffs. A carpet, or piece of tapestry, is spread over the bedstead and hangs down to the floor; upon the mattress is another; and a third is thrown over the regal figure. Curtains are suspended from the ceiling, and exactly over the bed depends a lamp.

A night-lamp was an indispensable accompaniment of the bed of persons of rank and means, during the twelfth, thirteenth, and fourteenth centuries. It was, at first, swung from the ceiling, but when curtains came into use it was swung from a rod in the centre of the supports, and thus hung down over the middle of the bed. When everybody believed in evil spirits and supernatural visitations of all kinds, darkness was a season of terror not to be encountered if it could be avoided.

Before canopies came into use, curtains were suspended from beams, either in the ceiling or below it; or they were festooned from one ornamental hook, or bracket, in the wall, to another. The earliest canopies appear to have been fixed into the walls at the heads of beds at one end, and to have been supported at the other by rods descending from the ceiling. The four posts that now uphold them are, comparatively, late inventions. In the chamber of Isabelle de Bourbon, wife of Charles le Téméraire, there was a grand green damask canopy which extended over two beds and a wide passage between them. This lady, like all the French kings and queens, had a chamber of parade, as well as a bedchamber, in which there was also a handsome bed. Both are minutely described by Aliénor de Poictiers.

In their "chambers of parade," the French monarchs received those courtiers who were entitled to greater privileges than the rest of the court, or court officers, but yet were not on sufficiently intimate terms to be received in their bed-chambers. The distinction thus drawn constituted the difference between the *grand lever* and the *petit lever*.

Oriental canopies must have been of great magnificence in very early times. Holofernes, we are told, rested upon his bed under a canopy, which was woven with purple, and gold, and emeralds, and other precious stones. And when the beautiful Hebrew woman smote off his head, she pulled down this canopy from the pillars, and carried it to the elders of her own people. "Behold," she cried, "the head of Holofernes, the chief captain of the army of Assur, and behold the canopy wherein he did lie in his drunkenness; and the Lord hath smitten him by the hand of a woman."

The State beds at Holyrood Palace and Hampton Court are, it will be remembered, all four-posters. They are only of Tudor, or sixteenth century, antiquity.

In the fifteenth century there was a form of bedstead in use which is still ordinarily used in the cottages of the north-country peasantry. It was inclosed with panelling about 8 ft. high, on three sides, leaving the fourth open; or on four sides, except in the centre of one of them, where there was sufficient space left for the occupants to get in and out. A foot-stool, covered with tapestry, or other rich material, assisted the apparently difficult processes of entrance and exit. The panelling was elaborately carved, and it was finished off with a handsome open-work cresting. Within, there were curtains, pillows, and a counterpoint of precious stuffs. Divested of all this ornamentation and colour, bared, indeed, into mere deal panelling, painted brown or drab, and rightly abhored by sanitary reformers, this piece of furniture is now known as a "box bed."

But the rudest bed-place of which we have written account is that of the inhabitants of St. Kilda. Writing of these primitive people in 1764, and describing their abodes, the Rev.

Kenneth Macaulay observes:—"The walls of these habitations are made of a rough gritty kind of stones, huddled up together in haste, without either lime or mortar, from 8 ft. to 9 ft. high. In the heart of the walls are the beds, which are overlaid with flags, and large enough to contain three persons. In the side of every bed is an opening by way of door, which is much too narrow and low to answer that purpose. All their dwelling-houses are divided into two apartments by partition walls. In the division next the door, which is much the largest, they have their cattle stalled during the whole winter season: the other serves for kitchen, hall, and bedroom." Worse than this follows. So much manure is made in every house by spreading the ashes of the peat fires all over the floor and treading them into a compost, that the walls which are 8 ft. or 9 ft. high to begin with are reduced to 4 ft. or 5 ft. on the inside, when it is time to use it and sow the barley.

From this picture of discomfort it is pleasant to turn and remember that many beds were so stately as to be extremely valuable legacies, in the Middle Ages. Many were, of course, heir-looms. Shakspeare, we call to mind, wrote in his will, "I gyve unto my wief my second-best bed, with the furniture." Inventories also afford us many curious particulars concerning them; and they are incidentally mentioned in some of the early statutes.

Henry VII. enacted that no one should expose for sale in any fair or market in his realm any feather beds, bolsters, or pillows, stuffed with any other material than dry pulled feathers or clean down, or any quilts, mattresses, or cushions that were stuffed with anything but clean wool or clean flocks. Scalded feathers, fen-down, morse-hair, neats' hair, and goats' hair were unlawful stuffing in the eyes of legislators in those days. Edward VI. endeavoured to meet a new contingency,—that of adulteration. He enacted that no one should offer for sale the articles above mentioned, though stuffed with dry pulled feathers and clean down, if these were mingled with scalded feathers, fen-down, thistle-down, sand, lime, and gravel.

Among celebrated beds, every one remembers the great bed of Ware. Mrs. Montagu's feather hangings, that Cowper admired so much, are also of world-wide reputation. Nearly every one is as familiar with his lines upon them as with Dame Dinmont's sheets, "washed with fairy-well water, and bleached on the bonny white gowans;" but either of these curiosities would be dingy by the side of the Oriental magnificence indicated in King Solomon's word-picture,—"I have decked my bed with coverings of tapestry, with carved works, with fine linen of Egypt. I have perfumed my bed with myrrh, aloes, and cinnamon."

Now, ought we to be content that our characters should be judged by posterity by our lumbering and most unhealthy four-posters; or will our anatomical iron bedsteads properly represent us in time to come? Surely there is great room for improvement in these items in our household effects.

THE PROPOSED ALTERNATIVE PRISON SYSTEM.

At the International Prison Congress, the sittings of which were lately held in the Hall of the Middle Temple, a number of foreign gentlemen, some delegates from their Governments, took part in the deliberations under the auspices of the Council of the Social Science Association. Questions relating to criminal law, criminal procedure, preventive police, punishment, treatment of discharged prisoners, and penitentiary systems, were discussed for about a week and a half; and among the more prominent members may be mentioned Dr. Wines, Major Du Cane, M. Stevens, Dr. Frey, Count Sollohub, Count de Foresta, Mr. G. W. Hastings, Mrs. Howe, the Right Hon. Sir Walter Crofton, and the secretary, Mr. Edwin Pears.

The time allotted for the above questions, or rather the minutes that could be spared for questions under the above heads, were not many, and it cannot hence be said that one single question was exhausted or even thoroughly gone into. Nevertheless, the fact of the congress's sitting brought together from all parts of the world a considerable and valuable amount of information on the prevention and repression of crime, including penal and reformatory treatment. In connexion with this may be mentioned the system of occupying prisons by intermittent sections proposed by M. Ed. Schmidt, of Petersburg, to which allusion has been made before in this paper, on the occasion of a lecture delivered in the meeting-room of the Social Science Asso-tion on the subject. With the aid of the annexed plans and diagrams, the reader will be able to follow the description and criticism here given.

It must be acknowledged at the outset that, whatever the merits or defects in M. Schmidt's scheme may prove to be, it is the only one which in a rounded and, to its details, finished form, has been presented to the public in general and to the members of the International Prison Congress in particular on the recent occasion. Its novel and principal feature is the constant use of all available space. Thus, instead of having a workshop and a sleeping-place, each capable of accommodating a number of prisoners used alternately,—say the workshop by day and the dormitory at night,—he uses the rooms constantly by bringing twice the number into them at the same time. That is, while one party fills the workshop he is unwilling that the space of the dormitory should remain unoccupied, and *vice versâ*. Having mastered this principle, there appear to spring up at once objections sufficient to make one close one's eyes; one almost refuses, on the plea of common sense, to entertain the idea any further. But that is not fair to a man who has evidently devoted years of thought and labour to his scheme, and who pleads for it "economy," which, if it be based on a sound basis, demands attention, or at least a full hearing of the case.

There crops up, for instance, the question of the night-work. To have one set of prisoners work their sentence out in night labour while another set work by day, or, in fact, to have night-work at all, is considered unjust, inhumane, and killing. However that may be, there are some among us who nevertheless have to give many a night to our callings. Police, railway guards, the staff of newspapers, members of Parliament, and not a few besides, are compelled to yield their nights at times, and with them often their rest, leave alone the number of brawlers and profligates who would fain turn night into day. But M. Schmidt has no such intentions. He does not propose to deprive the prisoner of his rest, nor that he shall work at night during the whole of his sentence, nor even, after the fashion of our hospital nurses, be on night duty for so many weeks and on day duty for so many. In almost imperceptible stages the prisoner works gradually later and later into the night, until at last he as gradually leaves the night work. Ten minutes, in fact, is to be the difference each day, so that a man who to-day turns to his work at midnight, to-morrow turns to it at ten minutes past twelve a.m., and after twenty-four days sleeps until four o'clock in the morning. In six times twenty-four the whole turnus is completed; that is, in 144 days each man begins again at the same moment at which he started. Out of this number of 144 he passes from ten minutes to four hours of his time between midnight and four a.m. in the workshop. Suppose one looked upon these hours as the critical night hours, it then becomes at once evident that of those he spends only 24 in 124, or one-sixth of his nights, and that only once for four full hours in the workshop. In the year consequently he has sixty nights of more or less disturbed sleep between midnight and four a.m., or a little more than the loss of one night per week. For those who consider the margin too small, and who consider eight hours of the night as necessary for repose, the figure is doubled, so that at the worst the prisoner would have to sacrifice two and one-third of a night per week. It may be added for those unacquainted with modern sentences that incarceration for life hardly exists anywhere now; that the longest sentences probably fall short of fifteen years on an average, and that ten years may be considered, on the whole, the longest term actually passed in a prison. The system of remission of sentence and pardons is extended to every deserving prisoner, and if he or she be detained longer than just indicated, it is not the fault of the authorities.

In the lower plan the dining-room is marked by the figure 1. The other rooms on that floor are kitchens, bath and wash-houses, offices, &c. In the upper plan the figure 3 indicates the class-room; 4, the dormitory; 5, the workshop. S S are special portions of these, for such prisoners as deserve a preference. The cells, C C, are disciplinary cells; V V, the ventilating shafts.

A complement of 300 persons would be divided into, say, ten sections of thirty persons each. There are consequently five sets of conjugate sections, each set sharing a dormitory and an *atelier*, and never in conflict. They always avoid each other. There can be no conflict either with any other set, because they, again, have their dormitory and workshop portions between themselves.

Before going into the points which are less clear than those hitherto explained, we will allude to a pamphlet published by Grunert, Bros., Berlin, on M. Schmidt's system. The author says that, having provided a wholesome and proper dwelling, suitable clothes, substantial food, time for rest, walking, and instruction, the country ought to reap the benefit derived from the prisoners' work. This might do more than cover the current expenses, if the waste space of prisons is utilised as above described. In ordinary gaols of, say 300 prisoners, there are 300 cells, *ateliers* for 300, kitchens for 300, dining-halls for 300, &c. That, the author argues, is twice as much room as is required. Where sections follow one another in successive order into the dining-room, yard, and class-room common to all, only one kitchen is required, and one dining and class room for thirty persons each; and cells and workshops for 150, instead of for 300 persons. Each prisoner has eleven hours' labour, nine hours' rest, four hours for meals, dress, walking, and intellectual pursuits. Hence, each of the five *ateliers* will be occupied for twenty-two hours; the five dormitories, eighteen hours; the dining-room, twenty hours; the yard ten hours; and the class-room, ten hours.

The following are the advantages propounded:

As regards economy:—

1. A saving of 50 per cent. on the outlay in erecting and arranging the prisons.

2. With a reduction to half the original number of buildings, the annual cost of repairs will be reduced in proportion.

3. Similarly much waste of capital spent on sundry requisites, utensils, &c., would be avoided.

4. The *atelier* system is productive, and capable of improved industry.

As regards the prisoner's reformation:—

1. The small number enables the sectional officers to exercise a direct influence on each individual prisoner.

2. The mechanism of the routine inculcates notions of order, obedience, and industry.

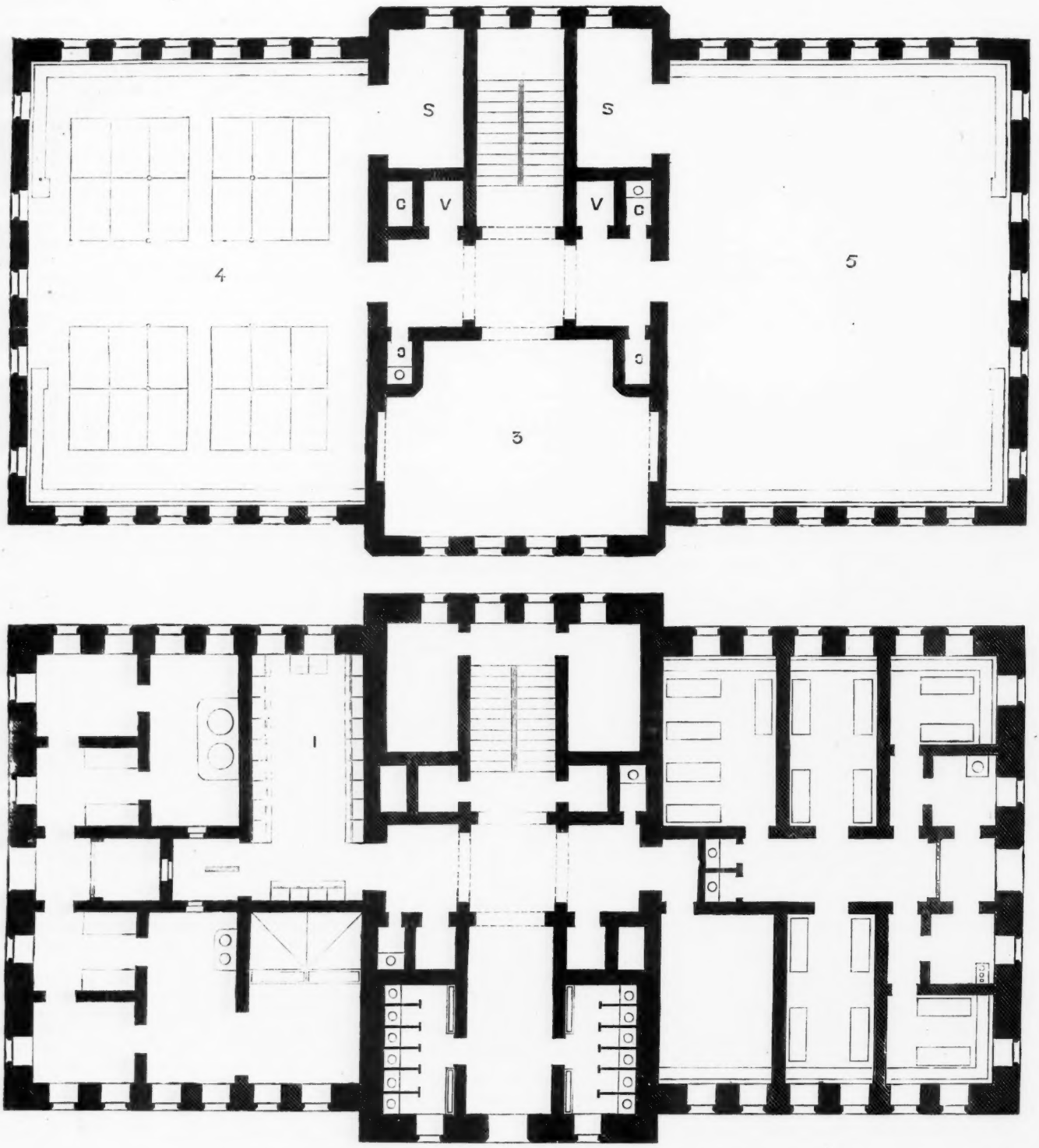
3. The remuneration of the prisoner on the value of his work would be a guide to an estimate of his reformation.

4. The erection of a prison on the proposed system, by way of experiment, can on no account be attended with any useless waste of funds; for, granting even the possibility of failure, there will always be room in a prison constructed on this principle to accommodate, instead of the two or three hundred prisoners, as here anticipated, half that number, thus performing anyhow as much as is ordinarily required.

There are some points of interest which might be overlooked, but which, nevertheless, deserve a careful scrutiny. The saving of 50 per cent., for instance, does not extend to the current expenses. It is impossible to have the same staff as in ordinary prisons. Take a manager or cook, for example. He cannot be supposed to go on for twenty-four hours; and besides this, it is doubtful if suitable persons could be found who would submit to join in the routine of the prisoners. It seems as if M. Schmidt intended superintendents of sections to stick by their flocks through day and night work for periods probably longer than any convict's sentence, before becoming entitled to a pension. To perambulate the dormitory, workshop, dining-room and yard, without feeling as much prisoners as those under their charge, would be a difficult matter to the officers.

We have once before touched upon the difficulty regarding Sunday. In countries where that day is kept as it is in this country, no work can be required at the hands of any prisoner. Supposing that the periods in the dormitories, yard, dining-room, and class-room remain the same, and that the workshops for the nonce are turned into places of worship, how shall the ten hours be passed in those workshops? M. Schmidt will be best able to answer these and similar questions, and he will have to do so satisfactorily before a practical trial would be contemplated by anybody, despite his explanations.

We afford him, as a foreigner, the opportunity to set forth his proposals, but we are not at present disposed to advocate them.



PLANS ILLUSTRATING THE PROPOSED ALTERNATIVE PRISON SYSTEM.

ST. PAUL'S COLLEGE, STONY STRATFORD.

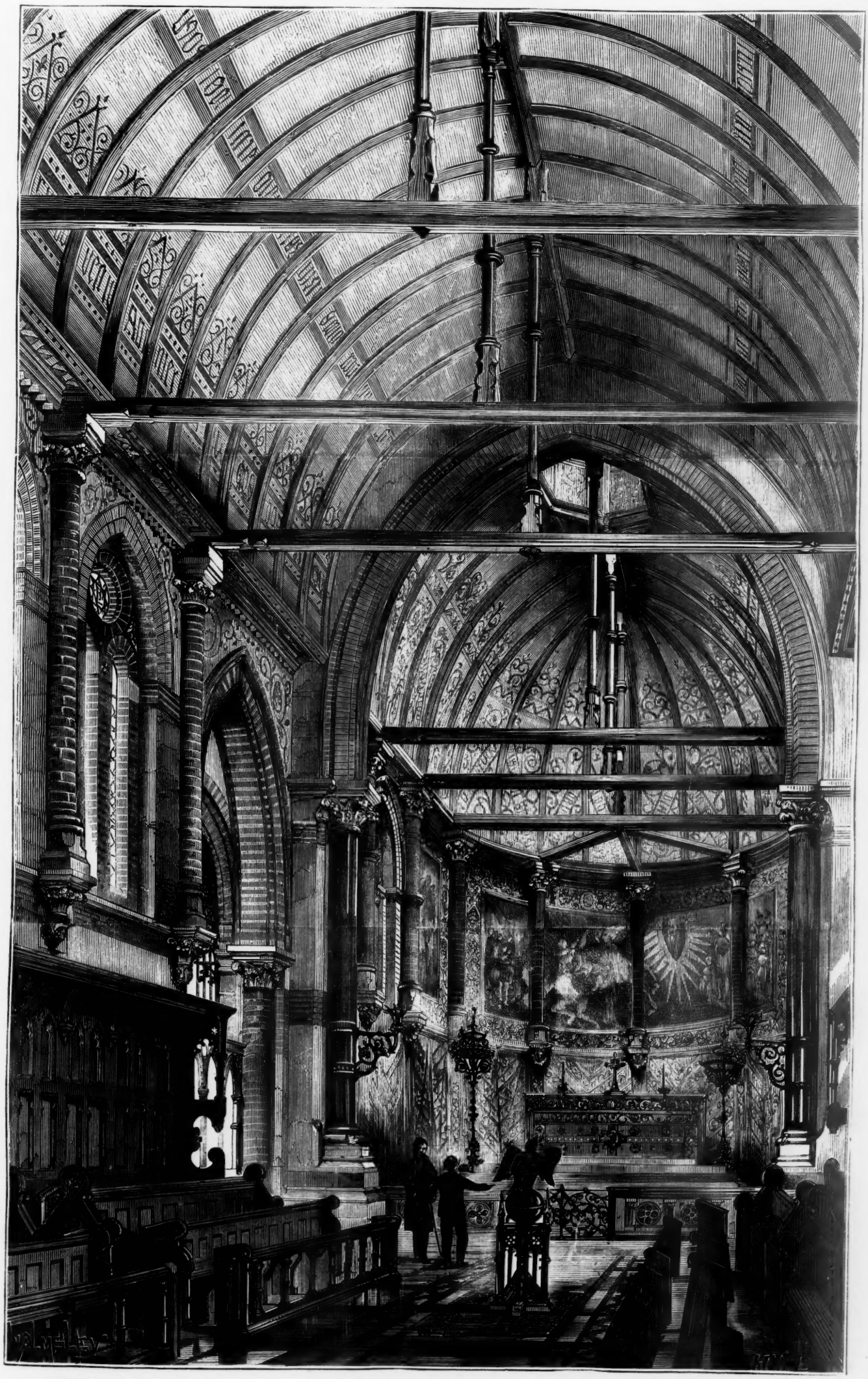
The chapel recently erected in connexion with the College of St. Paul, at Stony Stratford, promises to become an object of interest. The college itself, which has already 120 resident pupils, was founded about two years ago to provide for the sons of clergy and others of limited incomes a public school education upon the principles of the Church of England; and it is for the exclusive use of these pupils, with the masters and friends, that the chapel has been built.

The foundation stone of the edifice was laid in October, 1870. The plan of the building consists of an atrium, or enlarged porch, extending across the whole western gable of the chapel; a choir-proper for the members of the college; transepts, which combine organ-chamber, vestry, and accommodation for the servants of the college; and a deep sacrarium terminating apsidally. The total length is 114 ft. by 35 ft. across the choir. The style adopted is a treatment of Pointed architecture, adapted to the peculiar local materials, a greenish sandstone for the walls with red brick dressings; a very sparing use of cut stone being made. The contrast of colour between the local stone and brick, relieved by the lighter-tinted Bath stone, and carried out by the tiled roof, is harmonious and agreeable. In the interior, brickwork is used for architectural features with considerable success. Window tracery, cornices, wall shafts, piers, &c., are all carried out in this material. Stone, in the shape of sculptured corbels and capitals, and the introduction of some monolithic shafts of polished grey granite, add to the effect. The ceiling is arched and ribbed with tie-beams and shafted king-posts. The apse is unpierced by windows, but has a high roof-light from a spirelet, which rises just over the centre of the sacrarium, and which will afford light for the frescoes which are intended to adorn the walls, showing scenes from the life of St. Paul, the patron saint of the college. The floor all over is laid with tesselated patterns, the richer design being reserved for the sacrarium. The choir is fitted up with panelled and carved seats in oak and pine, arranged choir-wise, with a projecting canopy over the upper seats, and canopied stalls for the warden and chaplains.

Later on it is intended to erect an altar of marble and alabaster combined; and also a pulpit and screen in keeping with the style of the chapel. Some designs for filling two of the windows with stained glass will be carried out immediately; and it is hoped that early next spring the walls will admit of the intended decorations.

We have now only to add that Messrs. Goldie & Child were the architects under whose care the work was carried out. Mr. Frederick Aveline, of Stony Stratford, was the builder. The designs for the gas standards were executed by Messrs. Hart & Peard. Mr. Earp, the sculptor, of London; Messrs. Hargraves & Craven, who supplied the tiles; Mr. Hayball, of Sheffield, who executed the stalls, should also be named, as well as the clerk of the works, Mr. West. An eagle has just been executed for the chapel by Messrs. Margetts, of Oxford. The candlesticks and the wrought crucifix upon the altar are from the well-known *atelier* of M. Alexandre Chartier, of Paris.

The cost of the chapel is over 5,000*l.*, but almost as much again seems still to be required to complete the design. This expense is defrayed entirely by the warden of the college, the Rev. Walter M. Hatch, who is one of the fellows of New College, Oxford. The chapel is licensed for the performance of divine service and the administration of the sacraments under the Private Chapels Act.



CHAPEL OF ST. PAUL'S COLLEGE, STONY STRATFORD.—Messrs. Goldie & Child, Architects.

THE METROPOLITAN BUILDING TRADES MOVEMENT.

It is gratifying to be able to state before going to press this week that there is now every prospect of a speedy termination to the unfortunate misunderstanding between the employers and employed in the metropolitan building trades. A conference between the sub-committee of the Master Builders' Association and the deputation from the carpenters and joiners, for the purpose of arranging the points in dispute, was held on Tuesday, at the offices of the Association, No. 2, Westminster Chambers. The sub-committee of the masters consisted of Messrs. Hannen, Brass, Shaw, Macey, Trollope, and Bird; and the deputation from the carpenters were Messrs. Greedy, Mitchley, Mortimer, Whaley, and Burgess. The following document has been furnished as the result of the proceedings, which lasted about four hours:—

"2, Westminster-chambers, Aug. 27.

The working hours to be 52½ per week all the year round for joiners in shops, and 52½ hours per week for 40 weeks in summer and 48 per week in winter for outdoor work, leaving off work at 1 o'clock on Saturday during winter weeks. Wages to be 8½d. per hour all the year round. Overtime beyond the above hours, when worked at the request of the employer, to be paid for at the following rates:—For the first hour at 9½ per hour, and from the end of the first extra hour until 8 o'clock p.m. at the rate of 10½d. per hour; after 8 o'clock at the rate of 1s. 0¾d. per hour. This scale not to apply to the case of men working over-time at their own request or to make up time lost by them during the week. Extra time on Saturday to be paid for at the rate of time and a quarter up to 5 o'clock, and after that time at the rate of time and a half.

Moved by Mr. Hannen, seconded by Mr. Matkin, and carried unanimously:—

'In the opinion of the sub-committee of the Masters' Association and the deputation of the carpenters and joiners now met together, it is desirable that an endeavour should be made to settle all future questions which may arise on trade matters by conference or by arbitration.'"

On Wednesday morning, the bricklayers' deputation met the same sub-committee of masters. The deputation consisted of six members. Very little discussion took place. The deputation stated that they had not come fully empowered to settle the dispute, but were willing to enter into a discussion as to the terms of a settlement. The masters declined to enter into any discussion in these circumstances, and the deputation then retired to report to their committee the result of their interview.

In the evening, a crowded meeting of the carpenters' and joiners' nine-hour delegation was held at the Brown Bear, Broad-street, Bloomsbury, to receive the report of the deputation who had waited upon the masters' committee. About 160 delegates were present, and the following resolution was carried:—

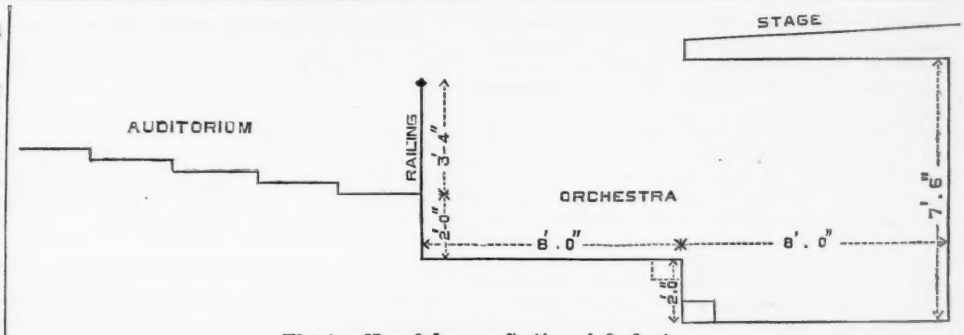
"That this meeting of delegates of the carpenters and joiners of London, having heard the report of their deputation elected to confer with the master builders' committee upon the existing points of the dispute, hereby agree to recommend that work be resumed upon the terms agreed upon between the deputation and the committee of masters. At the same time, we further recommend the continuance of this organisation, with the view of obtaining terms more satisfactory to the trade at the earliest opportunity, and also for the purpose of establishing the terms now agreed upon throughout the London trade."

It was understood that the great body of the men out on strike will forthwith resume work upon the new terms.

SHOPS WITHOUT BUSINESS, AND SHARPING AGENTS.

Sir,—I often notice with sadness many retail shops opened for a few weeks, then up go the shutters. These shops are mines of wealth to the modern business agents, who combine other *peculations*—loan office, debt collecting, and edit the *Dupers' Gazette*, or *Sharpers' Advertiser*, gratis per post! They ruin all that "*walk into the parlour.*" These deluders pluck their victims alive. When broken down in heart and purse, they know they are powerless to sue them for false representations. To expose them individually is a libel. Let us throw these fellows on their beam-ends by honest opposition. A few 'cute surveyors would for a small fee survey premises and locality before a venture. I recently bought a brush at a shop kept by a widow left with five children. Tears came into her eyes as she told me of taking only sevenpence in two days, notwithstanding representations made to her by the agent.

Genuine business shops seldom get into their hands: the other sort pays them best; for, as soon as one party is stumped out, they rig it up again. They believe in quick returns. They buy and sell all that rely on them. R. T.



Theatre, New Orleans: Section of Orchestra.

HERR WAGNER'S THEATRE.

Sir,—In your issue of June 15th, I notice a section of Wagner's proposed National German Theatre. In the accompanying remarks it is stated, that "the idea of an invisible orchestra will now, for the first time, be carried out."

Now, sir, I claim to have built a theatre in this city, which was opened on the 4th of December last, the orchestra of which was constructed in accordance with the enclosed section.

The orchestra it is intended to accommodate is only proportioned to dramatic performances, and composed, say, of fourteen or sixteen pieces. Still the principle involved is the same.

A carefully-constructed sounding-board encloses the space under the stage. By this arrangement the effect is in no degree impaired.

B. M. Harrod, Architect.

New Orleans, Louisiana, U.S.

THE CITY CHURCHYARDS AND BUNHILL FIELDS CEMETERY.

An agitation has for some time been in progress for the conversion of the several City churchyards into gardens and recreation-grounds for the benefit of those whose vocations confine them chiefly to that locality. Several of the City churchyards have been so converted, and it is urged upon the City clergy and churchwardens that a very small voluntary rate would suffice so to transform the rest and convert them into pleasant places of resort. In connexion with the subject, it is alleged that Bunhill Fields Cemetery is in a deplorable condition through neglect. It is urged as a ground of complaint that the trees and flowers are poor, the grass long and ragged, and the footways of grimy asphalte instead of being neatly laid down with cheerful gravel. It is moreover stated that the tombs are in a distressing state of decay; the inscriptions, even on some of the so-called restored tombs, illegible; and the general appearance of the place leading to the belief that Dissenters, having buried their dead, straightway forget all about them.

AMERICAN BLACK WALNUT.

Sir,—Permit me, through the medium of your journal, to direct the attention of architects and cabinet-makers to the great value and beauty of black American walnut-wood. My attention was first directed to its use by an accident; and during now a period of seventeen years I have tested its durability and adaptability for almost every kind of woodwork. I have had it used for the *largest* and most costly kinds of furniture, with carvings of the most elaborate kind. I have had it used for doors exposed to the full action of the weather; for conservatory-doors, exposed to constant damp, and considerable changes of temperature; for a large and costly staircase, the whole of the walls being covered with the same wood, and the floors of the same; for internal doors and casement windows, of rather large and costly construction, and carved, and for every kind of smaller cabinet-work, exhibiting the highest taste and good workmanship; and for all these purposes I have found the wood answer most admirably. It appears to bear rough external wear quite as well as oak. It does not warp or crack like oak, and bears the greatest transition of heat and cold without any visible change. The colour of the wood, when oiled, is perfect,—that natural rich brown colour, which three centuries of wear will alone give to oak; it has a close grain, without much figure; is thoroughly well adapted for every kind of carving; and its cost now is not higher than oak.

It is to me surprising that for every species of *good church-work* it is not used. It has every possible advantage over oak, and in old cathedrals requiring new stall-work its rich brown colour would give it a great advantage over the pale brownish yellow hue of new oak,—which to my own taste is most offensive. After great experience, I know not one drawback to the use of black American walnut; and want of knowledge of its many excellent qualities has, I am sure, alone prevented its more general use.

K.

SWIMMING FROM ENGLAND TO FRANCE.

Mr. J. B. Johnson, who imposed on the inhabitants of the metropolis some time ago by a pre-arranged act of *extempore* daring, seems to have been playing another trick of a similar kind. He started with much pomp and circumstance, and "for a large wager," to swim from Dover to Calais,—a work of at least twelve hours, as was calculated,—and before he had been in the water one hour it was found that the circulation was failing, and he was taken on board a steamer that had been hired by Mr. Strange to accompany him. If it was an honest affair he ought to be ashamed of himself for not having first assured himself that he could, at any rate, approximate success. But the whole thing looks like a well-greased advertisement-trap, into which all the newspapers seem to have slidden easily. In the interest of good-faith Mr. Johnson and his backers should be made to answer a few questions.

THE PREHISTORIC CONGRESS AT BRUSSELS.

The Congress of Prehistoric Archæology opened in the Ducal Palace, Brussels, on Thursday in last week. At noon the members met in the Gothic Saloon of the Hôtel de Ville, where M. Orts, on behalf of the Bourgmestre, M. Anspach, welcomed the Congress and thanked the distinguished *savans* who had come to throw light on the historic problems of obscure and distant periods. M. Hagemans replied on behalf of the Congress, and M. Worsae, the Danish archæologist, in the name of the foreign members, returned thanks to the town of Brussels for the hospitality extended to them. A *déjeûner* was then served, and at two p.m. the Congress met in the Ducal Palace, M. d'Omalius d'Halloy presiding. The king honoured this first sitting with his presence; M. Delcour, Minister of the Interior, and General Guillaume, Minister for War, being in attendance on his Majesty.

On Saturday an excursion to the Valley of the Lesse took place. The excursionists went to Dinant by rail. All along its course the Lesse runs between ranges of high hills of varied shapes, presenting alternately huge mountain ribs of bare rock and of woods. Along the river banks are numerous caverns where the cave-men had their dwellings. Nearly all these caverns have been investigated by M. Dupont, the director of the Brussels Museum of Natural History, who acted as interpreter. His disquisitions were followed by lively discussions among the archæologists and geologists present. He commenced with the *Trou Magrite*, where multifarious objects of the age of the Mammoth have been found, some of them showing beginnings of the art of sculpture. A long and steep mountain-path leads up to this cavern, where there are four superposed ossiferous layers. After this, however, troubles of the day commenced. Lesse has many windings and few bridges, and to carry out the programme it had to be forded four times. Cars sank in the water, and only after great trouble was the company brought to

the other side. One car, containing five ladies, was nearly upset. After luncheon on a romantic spot, the Lesse, to reach the Trou-de-la-Naulette and the Trou-de-Challeux, had to be crossed again. As the side of the mountain reaches down close to the opposite bank, the river was to be traversed in boats. Several hundreds crossed over, and the crowding in the boats was great. On the return from the caverns the boats were even more crowded, and one of them went down, and eighteen persons were thrown into the water, among whom were Mr. Franks, of the British Museum; Madame Royer, the interpretress of Darwin's theories in France; and M. d'Omalius d'Halloy, the president of the Congress. All got to the shore, however, and returned to Dinant without further accident. Shortly before midnight the party arrived at Brussels, after a day of useful research for many and enjoyment for all who had taken part in the excursion.

BORING IN THE WEALDEN.

We shall watch this important experiment with great interest, and trust there will be no lack of funds to carry it through successfully. The place where the boring has been commenced is known as Councillor's Wood, near Battle, on the estate of Mr. J. C. Mappin. Mr. Bosworth, who is conducting the boring, drives by steam a cutting tube, a sort of closed auger, at the end of an iron rod, weighted on the top, and fresh joints of rod are screwed on between the auger and the weight as they are required. The auger itself is about 2 ft. long; and it produces a perfect cone of the strata through which it has passed. Mr. Bosworth has elsewhere carried boring to a depth of 2,000 ft. When great depths are attained, the revolution of the rod at the top of the bore is not immediately communicated to the auger, but may be said to take time to reach it, so that the rod twists. Theoretically, each 20 ft. of rod make a three-quarter turn before communicating the rotation to the portion below; so that every 100 ft. require six complete revolutions at the top before the auger feels the movement. The workmen soon learn to tell, by the sensation communicated by the rod to the hand, whether the auger bites, and at a depth of 100 ft., if it did not bite on the completion of six, or at most seven or eight, revolutions, it would be pulled up, and a faulty joint of the rod looked for and removed. In theory, of course, the six turns would be distributed over the whole length of the rod; but the iron is not perfectly homogeneous, and so, in practice, it is the weakest or softest part of the rod that receives all, or nearly all, the twist, and that would break if the twist were carried too far. For the surface soil the auger is 9 in. in diameter, but in deep borings is replaced by one of 2 in., or of only 1 in., in diameter.

LINCOLN ARBORETUM.

This public park, designed by Mr. Milner, was on the 26th inst. opened with much ceremony. It covers 12 to 13 acres of the southern escarpment of the table-land on which the upper part of the city stands, has two entrances on the summit and two on the lower level, one of the latter being the lodge, which has a tea-room attached to accommodate 200 people.

The chief feature is a broad terrace running from east to west, approached by three wide flights of steps, and having trees along its edges; a glazed pavilion is placed in the centre, and at each end a fountain. Drinking-fountains are also fitted up; two retaining walls are built—one to support the embankment, the other forming the northern boundary, and surmounted by a neat iron fence.

The grounds are tastefully laid out and planted; a maze is constructed with briar bushes, and a miniature serpentine lake, with two bridges; a number of casts of statuary are dotted about the grounds, the most prominent being a lion mounted on a pedestal.

The work has been some two years and a half in hand, and having been done chiefly by day work, will cost with the approaches upwards of 8,000*l.*,—something like double the contemplated outlay. The land belonged to the freemen, who in consideration of a payment on their behalf of 200*l.* a year from the corporation, sanctioned the scheme, for which an Act of Parliament was obtained. A screed of several acres along the summit was sold for villa sites, and the remainder appropriated for the arboretum.

RESULTS OF THE EXAMINATIONS OF SCIENCE SCHOOLS AND CLASSES.

The following is from the list of Queen's Medallists,—science examination, May, 1872:—

Subject 3: *Building Construction.*

Name.	Age.	Occupation.	School.	Teacher.	Medal.
Painter, Edwin T....	26	Clerk	Portsmouth School of Art	Carter, J.'...	Gold
Southey, H. J. ...	20	Carpenter...	Taunton School of Science and Art ...	Rowe, J. ...	Silver
Harper, Eaven ...	18	Clerk	Birmingham, Bloomsbury Institute ...	Smith, A. F.	Bronze
Lewis, Wm. G. B....	19	Architect's Clerk ...	Charterhouse, St. Thomas's School ...	Mills, S. F.	Bronze

THE NEW INFIRMARY FOR CHELSEA.

On the day appointed by the Local Board of Guardians for opening the tenders, Mr. Gough, representing Mr. Giles, the architect, being present, the following tenders were received:—

Neave	£19,882 0 0
Heath	19,351 0 0
Fish	18,985 0 0
Stephenson	18,459 0 0
Elliott	17,967 0 0
Messrs. Leathby	17,955 0 0
Gough	17,600 0 0
Sawyer	16,885 0 0
Manley & Rogers	16,797 0 0
Thorne & Co.	15,750 0 0
Rankin	16,135 0 0
Turrell	15,587 0 0

Mr. Birch moved that the tender of Mr. Turrell be accepted, as it was the lowest.

Mr. Sydney, contending that it was a wrong time to embark in building speculations, moved the postponement of the question for six months, and after some discussion this was carried by a majority of 8 to 6.

NEW HOSPITAL FOR SOUTHAMPTON.

The Sanitary Committee of the town council at the last meeting of the council, reported that Mr. Lemon, the borough surveyor, had informed them that, having made an approximate estimate of the cost of the proposed hospital at West Quay, he found that it would much exceed the amount which he thought the town council were prepared to spend. As far as he was able to judge, without making an estimate in detail, the hospital would cost upwards of 7,000*l.* The surveyor also submitted detailed plans and drawings; after which the committee resolved that Mr. Lemon's report be submitted to the council, and they approved of the plans, and recommended the Local Board to adopt them, and carry out the works. At the same meeting Mr. Lemon submitted a reserved estimate for reclaiming the foreshore, building quay walls, and putting in foundations for the proposed hospital, amounting to 1,167*l.*, and the following tenders were submitted for the work:—Messrs. J. Bull & Sons, 1,139*l.*, and Mr. John Tate, 1,180*l.* The committee recommended the Board to accept the former.

The council appeared, from the ensuing discussion, to be taken by surprise at these calculations, and in the end an amendment on the motion for adopting the report, to the effect that its consideration be adjourned, was passed by a majority of 21 to 11.

SCHOOL BOARDS.

London.—The Works Committee have reported as follows:—

"On the 26th of June the committee were instructed by the Board to take the necessary steps to invite a competition of four architects for the Board offices to be erected on the Thames Embankment. They now beg to submit the conditions and particulars which have been drawn up for the guidance of the competing architects."

The conditions stated that the offices are to be erected on the Thames Embankment, near the Temple Station, the accommodation to include, besides the offices for the staff, a board-room for forty-eight members and accommodation for the Press, together with a public gallery for about 100, with separate entrance. The report was approved. On the recommendation of the Works Committee, it was resolved to appoint to the architect's department a chief draughtsman at 200*l.* a year, six efficient assistant draughtsmen at salaries not exceeding 120*l.* a year, and a "practical man," at a salary of 2*l.* 2s. a week, to take charge of the structural drawings and specifications. Mr. F. W. Roper and Messrs. Lee Bros. & Pain were appointed architects respectively for schools to be erected in Hunter-street, New North-road, and Gloucester-street, Stepney. The tender of Mr. W. E. Nightingale, amounting to 5,578*l.*, for the erection of a school on the site in Mary-street, Bromley, was accepted.

Leicester.—A report from the Architects' Committee as to the tenders for building the Syston-street schools, has been adopted by the Board. There were thirteen tenders, and that of Mr. T. Duxbury, for 4,913*l.*, was recommended by the committee. The subject of sites for other schools has been engaging the attention of the Architects' Committee. Mr. Hollingworth inquired if it was not time for the Architects' Committee to take some steps for obtaining a clerk of works. As soon as the contracts were signed the work would be commenced, and they would want some one responsible to see to it. It was agreed to call the attention of the committee to this subject.

Rochester.—The clerk stated that the plan of the Board's new schools had been sent to the Educational Department. He further said it was considered necessary, that adjoining property should be purchased, in order to furnish proper ventilation, good drainage, and a playground for the boys. It was agreed that advertisements inviting tenders for the erection of the school should be issued. Mr. Walker, the architect for the new schools, said he had received no communication as yet from the Education Department respecting the plans, but he believed they would be adopted. There would then be plenty of time to proceed with the work, the builders' strike being expected to terminate every day, while the price of iron was falling. Mr. Belsey said Mr. Burrell, the owner of the property adjoining the proposed new schools, had told him that he would not allow the Board to open any windows or doors at the new school, near his premises. Mr. Hayward said no one could prevent the opening of doors or windows on a public road.

THE LATE HECTOR HOREAU, ARCHITECT.

We hear with regret of the death of M. Hector Horeau, of Paris, at the age of 71. He had received more medals than commissions, and was the author of plans which brought fame and fortune to other men of his profession. One of these medals was obtained in London, in 1850, for a plan for an Exhibition building in Hyde Park. M. Horeau believed to the end of his days that had he not been a Frenchman the Exhibition Committee would have preferred him to Sir Joseph Paxton. He was one of the earliest projectors of a submarine tunnel between England and France. During a short residence in England he designed and superintended the erection of an odd house in Avenue-road, Regent's Park, a view of which will be found in our earlier volumes. Years ago the writer, then a boy on his first tour, breakfasting with Hector Horeau in Paris, found him attired in a close-fitting red dress, *à la* Mephistophiles. He was a man of considerable ability, but his success was scarcely commensurate.

THE NEW GREEN-COAT SCHOOLS AT CAMBERWELL.

About twelve months ago the Bishop of Winchester laid the foundation stone of the above-named schools, facing Camberwell-green, which have just been completed and opened, with the exception of the infant school, which will be ready for occupation in the course of a week. Some time ago it was determined to take down the old building and erect the larger and more convenient structure now finished. The style of architecture adopted is the Gothic, the materials used being Kentish rag-stone, with Bath stone dressings. The main elevation, which consists of three stories, is 84 ft. in length and 54 ft. in height, there being a handsome spirelet or bell-cot, at the south end, 24 ft. in height. The building extends 168 ft. backwards, and on a portion of this area stand the boys' and girls' schools and class-rooms, the remaining space being set apart as a playground. The central portion of the front block contains the masters' and teachers' residences, and at the

south-west corner is the board-room. The principal boys' school-room, which is on the ground-floor, in the rear of the building, is 70 ft. by 20 ft., and attached to it are two class-rooms 18 ft. by 20 ft. each. On the first floor above there is also another boys' school-room, 38 ft. by 20 ft., with two class-rooms, 18 ft. square. The girls' schoolrooms are on the ground and first floors, and are T-shaped, their extreme length being 53 ft. by 20 ft., and their extreme width, 49 ft. by 20 ft., each school having class-rooms 20 ft. square. There is also an infants' school of the same dimensions as those for the girls. The cost of the building is estimated at a little over 4,000*l*. Messrs. Payne & Clarke, of Buckingham-street, Strand, are the architects, the contractor being Mr. Crabb, of Kingsland-road.

CONCRETE AND THE METROPOLITAN BOARD OF WORKS.

Sir,—Surely some of your more able correspondents will not let the strange notice appearing under the above heads, in your last week's paper, pass without some comment. Am I to understand a concrete wall, built between Tall's patent panels, is according to the Act of Parliament, and that one built in the same way with the same kind of materials, between planks bolted together, does not come within the rules? Surely this cannot be fair to those who do not care to purchase an expensive apparatus. I have built with them extensively, and am doing so now in King-street, Borough, but I also find I make equally good walls between planks. If one is considered to come within the rules of the Act, why not the other?

Tall has been several times summoned by the Metropolitan Board for this system of building as contrary to the Act, and each time the complaint has been withdrawn or hushed up.

H. Goodwin.

THE LONDON INTERNATIONAL EXHIBITION OF 1873.

Her Majesty's Commissioners for the Exhibition of 1851 announce the third of the series of annual International Exhibitions of selected works of fine art (including music), industrial art, and recent scientific inventions and discoveries. It will be opened at South Kensington, in April, 1873, and closed in October, 1873. The exhibition will take place in the permanent buildings erected for the purpose, adjoining the Royal Horticultural Gardens. It will consist of three divisions—Fine Arts, Manufactures, and the Recent Scientific Inventions and New Discoveries of all kinds. The productions of all nations will be admitted, subject to the decision of competent judges as to their being worthy of exhibition, and provided they have not been exhibited in the previous International Exhibitions of this series.

A RESERVOIR INJURED BY A WATERSPOUT.

An examination of the chief reservoir supplying the Fylde Water Works, in Grizedale Fell, above Garstang, and an inquiry in the district constituting the "gathering-ground," have tended to reveal a state of things showing that damage to the extent of many thousands of pounds has been done by a waterspout, and that the works have been thrown completely out of order. During the late heavy rains a waterspout burst upon the Fells of Bleasdale, above the water works, and this was so tremendous that it washed down vast quantities of peaty earth, ling, &c. into the reservoir. The rush of the converging currents was terrific, the reservoir was swollen 3 ft. above the ordinary overflow, and it was feared by the man in charge that the whole place was going to be swept away. Luckily, the principal embankment, which some time ago showed signs of weakness, and was afterwards repaired, fully stood the great pressure put upon it, else the valley below would have been inundated, and sad havoc would have been caused. The reservoir was, however, filled with all kinds of refuse; its water (many millions of gallons) was totally spoiled; and it will take about five months to clean it out. It is calculated that the work of emptying the reservoir, and of repairing it, will cost about 2,000*l*.; and that the total damage in loss of water, derangement of works, &c., may reach 20,000*l*. Fresh supply-pipes to feeders adjoining the reservoir will have to be laid, to partially provide for the extensive district hitherto using the water. The supply for the vessels at Fleetwood, and for the streets of that town, and of Blackpool, &c., has been stopped, and it is thought that the general supply will have to be cut off every night, or at intervals during each day, till the work of reparation is accomplished.

A GERMAN BOARD OF HEALTH.

The Chancellor of the German Empire has proposed to the Federal Council, states the *German Correspondent*, to create a board of health for the empire, composed of ordinary and extraordinary members. The duties of the former, who must be resident in Berlin, would consist in aiding the Government to exercise a supervision over matters in the province of the medical and veterinary police, to take cognisance of all analogous institutions existing in the different Federal States, to prepare and submit legislative measures to the empire, to observe the practical working of laws enacted in the interest of the public health, and in particular cases to report on them to the State and local authorities, to follow the progress of medical legislation in foreign countries, and to organise a satisfactory system of medical statistics for Germany. The extraordinary members would have to be selected from persons who do not reside in Berlin, and from the municipal officers of the larger German towns, professors of medicine, Government medical officers, or practical chemists and architects. They would be required to express an opinion on certain questions when summoned to do so by the president; to watch everything likely to affect the public health in the neighbourhood of their respective residences, and to report on it to the president; and, finally, to take part in the general conferences to be held from time to time at Berlin. These proposals of the Chancellor will, in the first place, be laid before a committee for examination, and afterwards submitted to the Federal Council.

"SPECIFICATIONS."

Sir,—I have seen your critique on my edition of "Bartholomew's Specifications," and shall be much obliged if you will make public my reasons for the omissions you mention in the work.

I still preserved the old names of first, second, &c., class of house, although under an obsolete Act, as it has always seemed to me the best way of describing a house. But you will find that this refers only to the first four specifications, and not at all in the new ones I have inserted.

With regard to my omission of concrete construction, I should like it to be known that it did not arise from ignorance or carelessness: I had even written a paper upon the subject, but omitted it because at present it is so much a matter of patent right that it seemed to me that I must advertise one or other of the companies now established, which is scarcely a proper thing to do in a work of reference. Besides which, any person wishing to build in any one of the patent systems need only to obtain the full instructions issued by the patentee.

In studying the matter, I find that you were personally so early in the field in advocating this system of building, that I am sure you cannot be pleased to find that some of the companies refuse to work under architects.

Fredk. Rogers.

INTERNATIONAL PATENT SYSTEM.

A recent deputation, which included Mr. Macfie, M.P., Mr. Webster, Q.C., Mr. Johnston, M.P., Dr. Haseltine, and Mr. Wise, C.E., have by invitation presented to the Government a written statement of their views on this subject.

It is suggested that negotiations should at once be initiated in accordance with the last resolution of the Select Committee of the House of Commons, who recommended

"an assimilation in the law and practice with respect to inventions among the various civilised countries of the world, and that her Majesty's Government be requested to inquire of foreign and colonial Governments whether they are ready to concur in international arrangements in relation thereto."

Three modes of procedure are presented for consideration:—(1.) An international conference; (2.) Correspondence between the Ministries of the various States and colonies; (3.) Communications between heads of the different patent offices. Some of the desired objects, it is thought, may be obtained by an assimilation of the official rules, as the patent laws in many States are similar in principle, though legislation may be requisite to secure a substantial uniformity in the practice under the various systems.

The deputation are of opinion that the grant of Letters Patent should be confined, as recommended in the ninth resolution of the Select Committee, to "original inventors, their assignees, or authorised agents," and they regard the recognition of the rights of the authors of inventions as indispensable to an international system. They state that an organised practice of "pirating" inventions exists, whereby foreign inventors are often deprived of their rights by "*first importers*," who anticipate them in their applications for English patents. The deputation submit these suggestions, which accord, they state, with the recommendations of the Select Committee, and they respectfully ask that early action may be taken by the Government calculated to secure uniformity in the various systems of granting patents for new inventions.

EDINBURGH CATHEDRAL COMPETITION.

Sir,—Will you allow me to disclaim any connexion with the design marked "Fidelitas" in the Edinburgh competition?

W. Burges.

UNFAIR COMPETITIONS: BRIGHOUSE.

Sir,—Your correspondent displays an amusing audacity in maintaining the mis-statements he propounded to your readers as to the amount of the original tender for the Brighouse Cemetery buildings; but no one will entertain a doubt as to where the better means of information lie. It might have been expected that he would have accepted my statement; but since he is pleased to doubt it, I hardly know whether I am justified in believing it myself. Since my authority is insufficient, and that of the *Brighouse News* also, the only newspaper represented at the meeting of the Board on the occasion of the opening of the tenders, let us turn to his own authority, the *Halifax Courier*. This very highly-esteemed journal equally contradicts his statement, for although the total of the lowest tender is, probably by a misprint, stated to be 5,932*l*. 5s., the separate items only add up to 2,929*l*. 10s. On this error, which must have been patent to an unprejudiced eye, your correspondent has based his charges against us.

In the *Instructions* I read (page 1, lines 16 and 17) that "the estimate of the cost of the building shall in no case exceed 2,000*l*." The document does not refer to the cost of the entrance-gates and boundary wall, of which the length is only given approximately, and of which the cost could not therefore be definitely estimated.

* * * * *

The board compared the working drawings with the competition drawings in lengths, widths, and height, and being satisfied that they remained substantially unaltered, they passed a resolution approving of them. So far as I know, your correspondent has not seen the working drawings at all, and I am sure that he has not compared them with the sketches. Where, then, are the grounds on which he has based his charge of unfairness? What is the value of his estimate?

With regard to the real discrepancy between our estimate and the tenders, it is, as I have already admitted, excessive; I have, also, fully accounted for it. The well-known rise of prices which has taken place since our estimate was made, exemplified as it is in the report which you publish (*anté*, p. 590) of a meeting of the Bradford School Board, must be familiar also to your correspondent if he knows anything of building, and will amply satisfy the judgment of your readers. Further, I endeavoured to finish the work internally in a superior manner.

F. Bartram Payton.

*** Mr. Payton's reply seems perfectly satisfactory, and with this the correspondence must end.

NEW GLOBE BRIDGE, PECKHAM.

Sir,—I beg to draw your attention to an article in the *Builder* of the 24th inst., headed "The New Globe Bridge, at Peckham and the Tradesmen" (p. 669), the particulars of which are false and groundless, thereby seriously injurious to my character as a contractor. In the first place not a single brick, or materials of any kind, has ever been placed in front of any tradesman's premises, but upon the banks of the canal, and on my own service ground. With reference to the piers, or rather (technically speaking) the abutments, I am happy to say they can be plainly seen above the water line by those who wish to see them. The statement, too, referring to my sureties is so far groundless, that they have nothing whatever to do with the work beyond that which is usual with sureties.

The deputation mentioned was composed partly of speculators, semi-impoverished previous to the commencement of this work, who, like many others, are looking out for an opportunity to plunge their hands into their neighbour's pocket.

I must add that no bursting of the dam has ever taken place, although considerable trouble and expense have been occasioned, owing to entirely unforeseen difficulties in the bed of the canal and the traffic thereon, no claim for which has ever been made upon the vestry, or certified by the engineer; therefore I must beg you to give this letter a place in your next issue, in order that the subject may appear fairly and truthfully before your readers.

S. S. Peach.

*** The article in our pages referred to is simply a report of statements made by the deputation and by members of the vestry.

THE DARLINGTON FEVER HOSPITAL.

In our paper of March 30th we inserted a letter under this head reflecting on the conduct of the Mayor of Darlington and other members of the Hospital Committee of the Darlington Town Council. The mayor having commenced an action against the publisher of this journal in respect of such letter, the statements therein made being denied, and having offered to stay proceedings on our giving up the name of the writer of the letter, and paying the costs incurred in the action, we express our regret that the letter was allowed to appear, and withdraw all imputations the letter may be supposed to reflect on the character of the Mayor of Darlington and other members of the Committee.

WHAT IS A SPONGE?*

Then comes the question, What is a sponge? Down here, in this wet hollow, we are sure to find some; in dark places, where the water is of some depth, almost every fragment of sea-weed has attached to it some living species of sponges, and they vary in size and structure, from mere specks to large and substantial masses. Now and then we may find them on the shells of oysters and crabs; and once, in our aquarium, a fine hermit came out of his shell to die, and was found to have a sponge as large as a hazel-nut attached to his soft body, just below the insertion of the last pair of legs.

Animal life may be said to begin or end in the sponges; they are the very lowest in the scale of animated nature; but it is quite certain they are not members of the vegetable kingdom. Take a piece of sponge, such as is commonly used on the toilet-table, and dip it into a thin solution of size, and you have a fair resemblance of its condition when living. The sponge proper is the skeleton, the gelatinous coating is organised and animal; and the best proof of the fact is afforded by the microscope, which reveals ciliary motion, and there is an end of the difficulty as to what place it should occupy. The openings in the sponge are chambers, interlaced with silicated fibres, and, by the play of the cilia on the gelatinous surface, the water is made to circulate from chamber to chamber, so that the sponges obtain their food by the same process as a vorticella or rotifer—namely, by creating currents through the agency of cilia. The exterior film is the life of the sponge; the skeleton is a deposit. But the film must be understood as pervading the inner as well as the exterior chambers, so that the currents of water pass through the entire mass, and carry nourishment to all the mouths for which the cilia work so incessantly. A very dead sort of creature is a living sponge. It has none of the organs of sense which distinguish terrestrial animals, and not even the irritability which makes a sea-anemone of so peevish or spasmodic a temper. But it has its history, however brief, like others of the great class of zoophytes. The sponges increase by gemmation. Little buds appear within the openings of the reticulated mass, and these at last detach themselves, and exhibit the same play of cilia as their parents.

CHURCH-BUILDING NEWS.

Holme-on-Spalding-Moor.—Bursea Chapel, which stands a little distance from the Market Weighton and Howden turnpike-road, has been opened for divine worship, without the usual ceremony of consecration. The Right Hon. Sotheron-Estcourt, Tetbury, Gloucestershire, presented to the promoters an eligible site, and, in addition, paid for the cost of building, as a memorial of the late Mrs. Estcourt. The architectural design is a modified form of the Early English, worked brick, with stone facings, and with bell-cote at the west end. Its dimensions are 54 ft. long by 18 ft. wide; to accommodate about 100, and with chair seatings. The architect was Mr. Wm. Butterfield, of London; and the contractors were Messrs. Castles, of Goole. There is no pulpit: a portable stand is placed along the side of the reading-desk, as a substitute, without the emblem of the eagle.

Chieveley.—The chief corner stone of the new nave of the church, now being rebuilt, bas been laid by Mrs. Robinson, the vicar's wife. Mr. J. West Hugall, of Oxford, F.R.I.B.A., is the architect directing the execution of the works; and Messrs. Wall & Hook, builders, of Brimscomb, Gloucestershire, are the contractors, for the sum of 2,168*l*. The walls of the new building are already 8 ft. or 9 ft. above the soil, and there is every prospect of the new church being completed and ready for divine service before next Easter. The new church will consist of nave, north aisle, vestry, and south porch, the present chancel and tower remaining. The walls will be built of brick, faced with Bath stone dressing; the roof open-timbered, wrought, varnished, ceiled between the rafters, and covered with plain tiles from the neighbourhood. Godwin's encaustic tiles will be used for the aisles. The seats will be of deal, varnished, open and low, and the pulpit, with prayer-desk, &c., of oak. The organ will be placed at the entrance from the north aisle to vestry.

* From the *Gardener's Magazine*.

Darlaston.—The parish church of Darlaston, which, with the exception of the tower and spire, has been rebuilt as a memorial of the late vicar, the Rev. Mr. White, has been reopened. The style is Pointed Gothic, and the building comprises chancel, north and south transept, and nave, and north and south aisles, accommodation being provided for between 1,300 and 1,400 persons, allowing more space to each than was afforded in the old church, and the aisle seats are all free and unappropriated. The exterior walls are cased with Codsall stone, with Greenshill stone dressings, and the roof covered with Broseley tiles, the ridge being surmounted with red crests. For the present the tower remains unrestored. It is intended to open a doorway through the lower part, to form the principal or western entrance. The roof is open, the timber being of pitch pine, stained and varnished. The nave is separated from the aisles by pointed arches, carried by decorated cast-iron pillars, and the chancel aisle is supported by carved corbels and Purbeck marble columns, with carved capitals. Light is supplied by means of clear-story windows of circular shape, and gallery and nave windows, two-light, with canopied heads, surmounted by trefoils; while in the chancel is a four-light stained-glass window, produced by Messrs. Wailes, of Newcastle-upon-Tyne, and given by Mrs. Brevitt. The subject is the four Evangelists. In the nave is another stained-glass window, given by Miss Hugill. Another stained-glass window, the gift of the Rev. C. B. Walton, curate, is situate in the gable over the chancel arch. Artificial light will, when necessary, be afforded by means of coronas, supplied, as was all the ironwork, by Messrs. Broad & Dowling, of Birmingham. The pulpit is the gift of Miss Dorsett, of Edgbaston. It is octagonal in shape, the materials used being Painswick stone and Devonshire marble. The organ has been transferred from the north aisle of the chancel to the south transept, which also serves the purpose of a vestry. The old seats have been scraped and cleaned, and made to match the gallery front and other new work, all of which is stained and varnished. The floor is laid with Maw's encaustic tiles. The architect gives an oak reading-desk. The whole building is heated by means of a hot-water apparatus, supplied by Mr. Blakemore, of Wednesbury. Mr. A. P. Brevitt, Darlaston, is the architect; Mr. Lovatt, of Wolverhampton, the builder. The erection of the edifice has been superintended by Mr. Taylor. The total cost will be about 3,800*l*., including outlay upon fittings, heating apparatus, and all other appliances, but not taking into account the value of the gifts.

St. Peter-le-Bailey (Oxford).—The foundation stone of the new church, which is about to be erected in New Inn Hall-street, has been laid by the Bishop of Oxford. The present church is situated at the corner of Queen-street and the New-road, and is about to be taken down to allow of the widening of the street at this place. The new church is to be erected about two hundred yards distant from the old one, on the west side of New Inn Hall-street, and adjoining New Inn Hall. It will consist of nave, chancel, and two side aisles. The body of the church will be 79 ft. long and 55 ft. wide, and the chancel 30 ft. long and 20 ft. wide. The organ chamber will be on the north side of the chancel, and also some seats for children. A square tower, with octagon turret for stone staircase, will be erected on the south side of this portion of the edifice, and underneath it will be the warming apparatus. The tower will be 77 ft. high from the ground to the battlements. A vestry will also be erected on the south side of the chancel. The style is to be Decorated. The ashlar work will be of Bath stone, Box ground, intermixed with stone from the old church and tower, and the window dressings and tracery will also be of the same kind of material. The interior of the building will be plastered. There will be four arches on each side dividing the aisles from the nave, and two smaller ones dividing the organ chamber from the chancel. At the west end there will be a five-light window, with tracery of the period of Henry III., and also a five-light window at the east end, and tracery windows on each side. The chancel will be paved with Minton tiles, and the seated portion of the body of the church will be a boarded floor. The remaining portion, however, will also be paved with tiles. The interior of the roof, which will be a high-pitched one, will be open timber, and covered with Stonesfield slates. The height of the roof from the floor to the ridge will be 52 ft., and that of the chancel, 45 ft. Mr. Basil Champnes, of London, is the architect; and Messrs. Honour & Castle, of Oxford, are the builders.

Bradfield.—The restoration of Bradfield Church, which was commenced several months since, is making progress. The work comprises the cleansing and repairing of the stonework in the nave and tower, and removing the galleries; re-warming, and re-seating the nave and chancel. It has been undertaken by Mr. Sampson, of Bolsterstone, and Mr. A. Hayball, joiner, &c., of Sheffield. There was accommodation, including the galleries, for 456 adults, but owing to the arrangement of the pews only a much smaller number could see and hear the clergyman. By the new plan 380 adults and 135 children, or 450 adults without children, will be seated on the ground floor. The chancel has already undergone considerable alteration and improvement, by cleaning and repairing the walls and removing the temporary vestries, and by the erection of a memorial east window by the Wilson family, of Brincliffe Tower.

Knutton.—The foundation-stone of a new church has been laid at Knutton. The new church is intended to accommodate nearly 400. The site is near Knutton House. The edifice is to be built by Mr. Bennett, of Burslem, from the designs of Messrs. T. Lewis & Son, architects, Newcastle. The design is Early Decorated, and the plan consists of a nave, 64 ft. by 25 ft.; with north aisle, 51 ft. by 13 ft. 3 in.; chancel, 30 ft. by 20 ft.; organ-chamber and vestry, each 12 ft. by 10 ft.; the nave will be 23 ft. 6 in. high to the spring of the roof, and 42 ft. to the under side of the ridge, and, with the chancel, aisles, &c., will have open-timbered roofs. The seats will be open benches of pitch pine, the walling will be of red Alton stone, and the roofs of tiles in ornamental patterns. Although at present only a north aisle will be built, provision is made so that a south aisle may be added at some future time should the requirements of the district necessitate the enlargement of the church, which, as at present arranged, will accommodate 383 persons. The cost of the building will be about 4,000*l*.

Stroud.—The screen has been removed from before the reredos, with which the parish church has been enriched by the Stanton family. The reredos has een erected as a memorial to their father, the late Mr. William Stanton. It was designed by Sir Gilbert Scott, in the Southwell Minster style of Gothic architecture, and is in harmony with the general design of the church. It extends the whole length of the chancel. On both sides there are niches surmounted by canopies, intended to receive figures of the Evangelists or some other fitting subject. This is not yet decided, and the niches are at present bare. The reredos, as seen at present, consists of three canopied panels, in which are carved in *alto relievo* scenes in our Lord's life. The group on the left represents the taking down of the body of Jesus. The centre group appropriately represents the resurrection. The canopies are carved. The groups have been designed and executed by Mr. E. E. Geflowski, of London and Rome, to whom the contract for the work was given by the architect. The architectural carving has been carried out by Mr. Morris Geflowski. It is estimated that when the work is completed the cost will be from 700*l*. to 800*l*.

Wolverhampton.—Considerable alterations are commenced at St. Paul's Church, a building erected about thirty-five years back, according to the then-prevailing type, having a chancel 4 ft. or 5 ft. deep, with a vestry at the back, over which latter is placed the organ. It is intended to remove the organ and wall-screen below, thus increasing the depth of chancel by taking in the present vestry, and erecting a new one on the north side of the church. On the south side will be built a new organ-chamber, with open archways towards the chancel and aisle, the lower portion being filled in with wood screens. Amongst other alterations, the font and pulpit are to be removed from their present situations in front of the chancel, and the former refixed at the west end of the nave. The present lath-and-plaster gallery front is to be taken down, and a lower one constructed in wood. The tender of Mr. P. Horsman, at 600*l*., for the general works, is accepted by the committee. Mr. J. R. Veall is the architect.

Thornton.—The new church of St. James, at Thornton, has been consecrated by the Bishop of Ripon. The chief stone was laid in October, 1870, with Masonic honours, by the Marquis of Ripon, as grand master of the Freemasons of England. The site, which is by the side

of the highway leading from Bradford, at the Bradford end of the village, was given by Mr. John Foster, of Queensbury and Hornby Castle, and the building has been erected from the designs of Messrs. T. H. & F. Healey, of Bradford, at a cost of 5,060*l.* The style of architecture is Early English. There is a chancel, nave, south aisle, and organ-recess. The roof of the church is an open-timbered one, and the roof of the chancel is circular. The nave is 85 ft. in length by 27 ft. 6 in. wide. The dimensions of the chancel are 33 ft. by 23 ft., and the aisle is 74 ft. long by 14 ft. wide. The height of the nave is 51 ft. At the east end, over the altar, there is a three-light window, surmounted by a rose-window, both of which have been filled in with stained glass by Mr. John Foster, jun., at a cost of upwards of 300*l.* The subject represented illustrates the *Te Deum*. It is the work of Messrs. Morris, of London. The west end of the building is lighted by a two-light window, the chancel with lancet-shaped windows on the north side, and above the latter are rose-shaped clearstory windows. There are in the aisle two-light lancet-shaped windows. The principal entrance to the building is by a porch, above which it is intended to raise a tower and spire. This part of the building has already reached the tower-base, which is at a height of 24 ft. The interior affords accommodation for about 600 people. The seats are open and are of pitch-pine, and the choristers' stalls in the chancel are of oak. There are three gas-pendants, to light the church at night. These have been designed by Messrs. Brown & Downey, of London. Mr. Wallace, of Girlington, has been clerk of the works, and the following are the contractors :—For the masonry, Messrs. T. Rouse & Sons, Thornton; for the woodwork, Mr. Patchett, Thornton; the plumbing, Mr. Jones, Thornton; painting, Mr. E. Barstow, Thornton; and slating, Mr. Smithies, Thornton. When the tower has been added, and it is hoped that before long the building committee will be in a position to accomplish it, the total cost of the edifice will be about 6,000*l.* Upwards of 4,000*l.* have already been obtained towards the outlay incurred.

Mold.—Gwernaffield Church has been reopened. The old church, which was an unsightly building, stood on the site of the present one, close to the village. The ecclesiastical district of Gwernaffield is but a small area, and contains a population, according to the last census, of 975, the greater part of which are at Gwernaffield, Pantymawn, and along the back of the limestone hills stretching from Rhydymwyn to the vicinity of the Loggerbed. It was found better to pull down the old edifice altogether, and build a new one. The architect of the new church is Mr. D. Walker, of Liverpool, and it is built in the Gothic style, and consists simply of nave and chancel. The framing of the roof is of stained wood. The aisle runs down the centre, and there are seats in the body of the church for about 250. Several of the decorations were gifts. The cost of the edifice was 1,500*l.*

Morton.—The foundation-stone of the new church, which is in course of erection in the village of Morton, has been laid by Miss Leighton, of Sweeney Hall, near Oswestry. The new church, which is dedicated to St. Philip and St. James, stands in a convenient situation on the site of the old building, and immediately adjoins the turnpike-road leading to Oswestry. It will be built in the Early Decorated style, and will consist of a nave and chancel, with north and south chancel aisles, severally appropriated to the purposes of an organ-chamber and vestry-room. The external elevation of the nave will be about 42 ft. All the seats will be free and open. The building will be constructed to conveniently seat 300 persons, the internal dimensions of the nave being 54 ft. by 21 ft.; south aisle, 54 ft. by 12 ft.; chancel, 26 ft. by 18 ft.; organ-chamber, 12 ft. by 9 ft.; and vestry-room, 14 ft. by 12 ft. The principal entrance will be on the north side, facing the turnpike-road, through a porch 10 ft. by 8 ft. The material used in the building will be supplied from local quarries, chiefly from Sweeney Mountain and Shelvoke. The roof will be covered with Staffordshire tiles, and the terminals of the gables will be surmounted with small stone crosses. The walls will be 2 ft. 9 in. to 3 ft. in thickness. There will be a bell gable at the western end, which will be filled in with a four-light window; a three-light window will be placed in the chancel, and light will also be supplied from twelve other windows of two and three lights each. The roof is to be a varnished one, open, and with open principals, and all of the arcades and interior openings will be of dressed Shelvoke stone. In the chancel, which will be laid with Maw's encaustic tiles, will be placed the sedilia, credence, and other adjuncts. The pulpit, as at present proposed, will be a stone one. The nave and aisles are level throughout, the chancel being raised by two steps, and the sacrarium by three. The warming apparatus of the old church,—a floor stove, by Dodwell, of Shrewsbury,—will be utilised for the purposes of the new structure. The works are being carried out from the designs of Mr. S. Pountney Smith, of Shrewsbury, architect, Messrs. Morris & Chaplin, of Oswestry, being the contractors. The outlay upon the work is estimated at between 1,600*l.* and 1,700*l.*, towards which nearly 1,500*l.* have been already subscribed or promised.

Sandford Orcas.—Having been enlarged, restored, renovated, re-fitted, and decorated, the parish church of St. Nicholas has been reopened. The whole of the church has undergone a restoration, and a new north aisle has been added. The chancel is of the fourteenth century, and has been preserved. Attention has been paid in preserving the ancient character of the external masonry. The new work is in the Perpendicular style. The paving of the chancel and manor aisle is of Maw's encaustic tiles. The roofs are of pitch pine, with curved ribs springing from carved stone corbels. The seats are new, of picked pitch pine, with carved bench-ends; the pulpit and reading-desk are carved, and rest on Ham stone bases. Under the tower-arch is an old oak screen, of the Perpendicular period, which has been restored. The manor aisle contains two stained-glass windows by Messrs. Clayton & Bell. A new window by the same artists has been placed in the chancel. The warming apparatus is by Messrs. Haden, of Trowbridge. The organ, which cost 80*l.*, is a small instrument, inclosed in a pine-wood case, with pipes of "best spotted metal." It was built by Mr. Hallett, of Kington Magna, and is placed at the western end of the new aisle. The tower has five bells, which are chimed by a new and simple arrangement. The work has cost about 2,000*l.*, and has been executed under the superintendence of Mr. Henry Hall, of London, architect, by Mr. A. Reynolds, builder, of Milborne Port. The funds have been chiefly provided by the lord of the manor, Mr. Hubert Hutchings, and the rector, the Rev. Urquhart Cookworthy.

Clifton, Manchester.—The first stone of a new church at Clifton, near Manchester, has been laid by the Hon. Mrs. R. Cotton. The building will consist of nave and aisles, transepts, with a spacious chancel, and chancel aisles. The style is Gothic, of the fourteenth century, and the church will accommodate 500 persons. The work is being carried out at the expense of Mr. and Mrs. Cotton, who have also given the site. The architect is Mr. Edward M. Barry, R.A., and Mr. Booth, of Gosport and London, is the contractor.

Dorking.—The contractors for St. Martin's Church are Messrs. Goddard & Son; not "Goddard & Terry," as stated.

STAINED GLASS.

St. Peter's Church, St. Alban's.—The series of stained glass windows in this church has just been completed by the addition of two on the south side of the nave. The whole of the windows in the chancel are of coloured glass, that on the north side representing the Annunciation of the Virgin Mary, and the one on the south side the Ascension of Christ. The east window represents a series of Scriptural emblems worked in detail. The two new windows in the nave have been executed in Brussels, by Mr. J. B. Capronier. The subject of the one nearest the western porch is the Parable of the Sower; the centre figure representing Christ, with the sower on the right, and three of the disciples on the left. Underneath the centre figure is a cherub bearing a scroll, and above are two figures of angels. The subject of the other window is the Parable of the Vineyard, representing the hire of the labourers. There is also on this window a scroll. The subjects of the other three windows in the nave are the Good Samaritan, the Good Shepherd, and the Prodigal Son, the former of which is a memorial window, as well as that on the south side of the chancel. The stonework of the two new windows has been restored by Mr. Haselgrove, of St. Alban's. The whole of the fourteenth-century glass on the north side of the nave has been collected and preserved. It is hoped that other stained windows, having for their subjects a continuation of the Parables, will eventually be placed in the church.

Great Berkhamstead Church.—The memorial window has been placed in this church by the high sheriff, Mr. Thomas Curtis, of the Hall, Berkhamstead. The window is by Messrs. Clayton & Bell, and cost upwards of 300*l.* Its subject is the Resurrection of the Blessed.

St. Mary's, Newmarket.—Stained glass has been placed in the east window of this church. The new glass, the cost of which has been defrayed by subscription amongst the parishioners, is the work of Messrs. Heaton, Butler, & Bayne, of Covent Garden. The three principal lights are filled with representations of the Nativity, the Crucifixion, and the Resurrection, and the smaller compartments in the heading of the window contain angels bearing shields, on which are represented emblems of our Lord's Passion,—the scourge, the hammer and nails, the reed and sponge, the spear, &c.: the two uppermost shields display the crown of thorns, while two others, bearing a lantern and censer, typify Him who is the Light of the World and our Intercessor in heaven.

St. Matthew's, Rastrick.—Stained glass, by Messrs. Hardman & Co., Birmingham, has been placed in the first window on the south-east side of this church. The subject is Our Lord sitting at the feast in Levi's house. The work is the result of a subscription raised amongst the congregation of St. Matthew's Church, and in memory of the late Rev. Thomas Haines. The window is square, and is so treated as to occupy the entire space; and the architectural details are in accordance with the Palladian character of the church. Some one has been employed in the work of erection whose care has not been sufficient to prevent the breakage of one of the largest pieces of glass which the window contains, and it is difficult to see how such a breakage can be satisfactorily repaired.

Seale Church.—A further addition to the stained glass of this church has just been made by the rector and his brother, in remembrance of their parents. A window, of two lights, in the south wall of the nave, nearest the tower arch, has been furnished with full-length pedestal figures of Simeon and Anna. In harmony with the gospel narrative (St. Luke ii. 25-38). The general treatment of the subject is in the Perpendicular style, with some details in the borders, from the Fairford windows. The artists were Messrs. Burlison & Grylls, who executed the stained-glass windows in the church of Hartley Wesnall. The other windows in the church are mostly of the Decorated period, by Willenent, Wells, Clayton & Bell, Baillie, and Mayer.

Miscellanea.

Subsidence of Land at Old Trafford.—Alarm has recently prevailed, owing to the condition of some house property situated near the toll-bar at Old Trafford. The back portions of the premises occupy a rather elevated position above the side of the bed of the old canal. Apparently in consequence of the soil not being sufficiently solid and firm, it yielded slightly, and appearances were presented in the way of cracks in some of the buildings, that gave rise to uneasiness, which increased on account of farther changes perceived. About six months ago the canal water was drawn off, and the subsequent effect of that seems to have been to take away the water from the surrounding soil, and cause the latter to sink. The Cheshire Railway Lines Committee, who own the bed of the old canal, have been constructing a 15-in. pipe drain below it, and the work is now progressing towards completion. It is found that four houses in Dalton-place are affected, and especially two of the buildings, where the cracks are more extensive, and the threatened consequences alarming. The inmates of the two houses have removed their furniture. The main parts of the line of buildings are built upon good foundations, and the danger is apprehended chiefly at the back.

The Great St. Gothard Tunnel.—The Swiss Federal Council has ratified the agreement with the contractor for the construction of this tunnel.

The Operative Bricklayers' Society have issued their second "London Strike Report," to be read at their various branch meetings. The number of men on strike during the four weeks ending the 10th of August was 119, of whom eighty-one belonged to the society, thirty of them being newly-enrolled members. In the fourth week the number was seventy-one, of whom only twelve were non-unionists. A sum of 98*l.* 11s. from the society funds was paid to eighty-four, including the above eighty-one, members on strike, being at the rate of 2s. per day per man, the time varying from one to eighteen days. The cost of administering this sum was 20*l.* 18s. 7d., of which the committee received 18*l.* 3s. In the seven preceding weeks ending the same date the total charge to the society for the strike amounted to 229*l.* 18s. 11d. During the three weeks ending the 5th of August, 111*l.* 8s. 4d. were collected in the way of subscriptions, and 47*l.* 13s. 7d. were obtained from trade levies, making together 159*l.* 1s. 11d., of which 142*l.* 8s. 4d. were distributed amongst the above 119 men, the cost of collecting and administration being 17*l.* 13s. 7d. Altogether, during a period of seven weeks, 264*l.* 13s. 3d. were contributed to this general fund, and on the 5th of August, 28*l.* 3s. 9d. remained in hand. For the last three of the four weeks covered by this report members of the society received strike pay at the rate of 1*l.* 3s., and non-members 11s., per week. The gross cost of the strike up to the 10th instant was 466*l.* 3s. 5d.

School Desks.—Mr. J. F. Moss, the clerk to the Sheffield School Board, has devised two new school-desks. The "Sheffield School Board Desk" is the title of one design; the other is to be distinguished as the "National School Board Desk," and both are arranged to seat the pupils in pairs. The latter can be constructed so as to have a separate locker for each boy or girl, and in this form it has, we believe, already been supplied by the makers (Messrs. Colman & Glendenning, of Norwich, and 23, Warwick-lane, London) to a large proprietary school just erected at Plymouth. A space of about 15 in. is left between each series of double desks in a group, but this space is more than counterbalanced by the saving effected in placing the desks closely one behind the other, and a very comfortable back is thus provided for each scholar. Additional writing-space is also afforded, the tops of the desks being wider than most of those hitherto used, and each pair of desks is provided with a footboard. The great advantage claimed for seating the children in pairs is that the teacher has more perfect and ready supervision of the members of his class, as he is enabled to reach any pupil in the least possible amount of time, instead of having to walk round the long desks, as under the old system. Some good opinions of these desks have been expressed. The question of space will probably arise.

A Proposed Livingstone Monument in New York.—The *New York Herald*, referring to the proposal to erect a statue of Dr. Livingstone in the Central Park, New York, makes the following remarks:—"We have a bust of Humboldt in the park and a statue of Morse, and it is eminently fitting that Livingstone, with whose history America is now so closely and pleasingly identified, should take his place by the side of the renowned naturalist and the famous electrician. The statue of Sir Walter Scott, by Steell, the well-known Scottish sculptor, from the original model which adorns the Scott monument in Edinburgh, will in a few months be placed in position, and the idea of the original projectors of the park, who desired that it should in time be a gallery of art as well as a place of natural beauty, is in a fair way of being realised. The statue of Dr. Livingstone is already made. It is the work of Mrs. Amelia R. Hill, the widow of D. O. Hill, member of the Royal Scottish Academy. It is to be erected in England in honour of Livingstone as soon as he returns home. Why should we not have the same model erected here at once? The design is admirable. The commissioners should secure a model of this great work, and place it in the Central Park at once, so that it may be first seen here by Dr. Livingstone when, as we hope and expect, he visits New York before he returns to his native land."

Port of London Sanitary Authority.—A first meeting of this new corporation committee was held in the Guildhall, Mr. G. S. Pedler being unanimously elected chairman. Various matters were discussed, bearing on the new duties entrusted to the corporation.

The Combustibility of Iron.—Professor Magnus, of Berlin, has recently devised a beautiful experiment to demonstrate the combustibility of iron, says the *Mechanics' Magazine*. He takes a straight bar magnet of considerable power, and sprinkles iron filings on one of its poles. These filings, of course, arrange themselves in accordance with the lines of magnetic force; and since, however closely they may appear to be packed, no two of the metallic filaments are parallel, a certain portion of air is enclosed, as in a metallic sponge. The flame of a spirit-lamp or gas-burner readily ignites the finely-divided iron, and it continues to burn brilliantly for a considerable time. If the experimenter stands on a little elevation, and waves the magnet to and fro while burning, a magnificent rain of fire is produced. The experiment was first performed in Berlin before the Emperor of Germany and his court. The late Professor Faraday used very strikingly to show the extreme combustibility of iron under certain experimental circumstances.

The Cambrian Archæological Association.—The members of this association are holding their seventh annual meeting at Brecon, and, like their English brethren, they not only read papers, but make pleasant excursions to the national and historical objects of interest within easy distance of the place which forms their temporary head-quarters. The general programme has been arranged, and excursions have been fixed for Brynllys, Aberedw, Cefn-y-bedd, Clawdd-y-gaer, Pytingwtijn, Digswylfa, Llandefailogfach, Maenmorwynion, Cwmbu, Digswylfa, and Bettws. It is said that complaints of neglect have been addressed to the general committee from Llyynnggffwwdvaur, Marthacwm, Blan-Gwrach, Llanvaircaerinion, Llanvairarybryn, and Llechcynvarwyddvach. At the Pontypool police-court, a Welchman has just been charged with assaulting another on a disputed point in the spelling of Welsh names; and no wonder!

Richmond School of Design, Victoria.—Richmond, which is a suburb of Melbourne, with a population of about 18,000 people, maintains successfully a School of Design. At the second annual exhibition and distribution of prizes, held last evening, the hon. secretary, Mr. M. Egan, architect, stated in his report that the average attendance was fifty-two, with ninety names on the list. The report proceeded,—

"A great deal has been said about the non-practical character of these schools. At first it was designed that our teaching might be of use to the students in their various callings, but we found that were we so severe in our teaching as to limit them to defined courses of instruction we would be unable to continue even in our present position. One school, in my opinion, has ceased to exist through following this course, and the fact is further illustrated by the most practical class we possess, namely, the architectural and mechanical, which, through our attempting to teach elementary principles, has fallen off from being the largest to the smallest. We can therefore only continue in our present course, and trust that the time will soon arrive when drawing shall be so valued that it shall be taught independently of the wishes of the learners."

Somersetshire Archæological Society.—The twenty-fourth annual meeting will be held at Taunton, on September 10th, 11th, and 12th, under the presidency of Mr. W. A. Sanford. After the president's address, Mr. G. T. Clark, will read a paper on "Taunton Castle." The castle, the churches, and other objects of antiquarian and historical interest in Taunton, will then be visited; and in the evening there will be a meeting for papers. On the 11th there will be an excursion embracing Cheddon, Hestercombe, Kingston, Norton Church and Camp, Bishops Hull, Rams-horn Bridge, and Trull; and on the 12th the excursion will embrace Bathpool by the old Road, West Monkton, Creech, North Curry, Hatch Beauchamp (if possible), Thornfalcon, and Ruishton. A third excursion is proposed to take place on Friday, embracing Orchard Portman, Thurlbeer, Staple Fitzpaine, Curland, and the Camp of Castle Neroche.

The North Surrey District School.—Complaints have often been made as to the bad condition of the children in this school, and a committee of the Wandsworth and Clapham Guardians have now reported:—

"They were deeply impressed with the general air of discomfort prevailing in every part of the establishment, and regret to observe the want of proper arrangements, want of ventilation, want of sufficient accommodation to separate children in different stages of disease, want of cleanliness, imperfect drainage, and the utter failure in the carrying out of what they had understood to be the resolutions of the Board in its general management. The Visiting Guardians regret to have occasion to report their great dissatisfaction on the state and conduct of the infirmary in the North Surrey School."

A more rigorous inquiry seems to be necessary.

Statistical Congress at St. Petersburg.—This is the era of congresses. On the 22nd inst., the labours of the Avant Congrès having terminated, the Statistical Congress at St. Petersburg was formally opened by the Grand Duke Constantine. His imperial highness delivered an elaborate inaugural address, which was enthusiastically applauded. He concluded his address by bidding the congress welcome in the name of the Government and formally declaring the session open. The programme of the entertainments for the congress included an invitation from the Emperor to dine in the palace at Tsarkoé-Selo on the 25th, from the Yacht Club to a *fête* on the 26th, and an excursion to Peterhof and Cronstadt on the 27th. The city of Moscow also sent an invitation to the members to visit the Polytechnic Exhibition, and to accept the hospitality of the municipality.

A New London Park.—The Metropolitan Board of Works have now completed the improvements of Stepney-green, already alluded to in a previous number, and have thrown it open to the public. This is a valuable addition to the recreation grounds of the metropolis. For many years past the large open space known as Stepney-green, situate in one of the most crowded quarters of the east of London, had fallen into a neglected condition. At the instance of the local authorities, the Metropolitan Board have contributed the whole cost,—about 3,000*l.*,—of converting the waste fields into flower garden and public recreation grounds. Stepney-green is the last remaining remnant of the once famous Mile-end-green, the rendezvous of the rioters of Essex in the insurrection led by Wat Tyler in 1381, and the trysting-place of the civic archers of the Tudors.

"Weighting" Paper and Cloth with Slate.—Protection has been obtained for an invention which consists in the employment of ordinary slate, or the mineral from which the slate is quarried, in a state of fine dry powder, or of fine wet pulp, and using it in both conditions as articles of commerce, either with or without the addition of any colouring matter. Slate of different colours is selected as desired, and ground to any degree of fineness in the dry or moist state, and this powder, or pulp, in its natural colour is to be used for "stiffening and weighting" cotton or other cloth or paper, either used alone or in combination with china clay or other similar substance. The dry powder or moist pulp is also to be coloured to any tint required, and used in the manufacture of pigments or colours.

Gas Explosion.—At No. 1, Shrewsbury-villas, Plumstead, on Friday night, the occupant (a widow lady), being rendered uneasy by a strong smell of gas, called in her next-door neighbour to their help. Seeing that there were lights burning in the drawing-room, he thought there could be no danger of an explosion, and, getting upon a table, proceeded to search for the leak in the gas-pipe. For this purpose he struck a match, when the gas, which must have accumulated in the upper part of the room, exploded, with a very loud report, hurling him through an open door into the next room, and burning him severely about his face, neck, and hands. A young lady also had both hands burnt, and the curtains and furniture in the room were ignited. The house itself was greatly damaged.

Decline of Cholera Symptoms.—In accordance with what we have more than once pointed out during this summer season as what might be expected in so open and thundery a year, not only in this country but over Europe, it is now stated that the cholera "has not during the last fortnight really advanced at all in a westerly direction" from Asia, and that "the epidemic appears to be steadily declining." But whatever may happen abroad, this is no cholera year for England; and moreover, the autumn and winter will probably be more than usually healthy otherwise, as is generally the case when so much and long-continued rain has washed away the decaying, putrefying, organic wreck of spring and summer.

Society of Engineers.—Arrangements have been made for a visit of the members and associates of this Society, on (this) Friday, to the works of the Ransome Stone Company at East Greenwich. After leaving the visitors were to proceed to the adjacent works of the Bessemer Steel and Ordnance Company, then to be inspected.

Opening of a new Drinking Fountain in Tunbridge Wells.—A new fountain has been opened at the junction of two roads of the town of Tunbridge Wells (the Grosvenor and St. John's) leading into the heart of the town. The Hon. F. G. Molyneux addressed a numerous assemblage on the occasion, as did also Mr. Weylland, a member of the Metropolitan Drinking Fountain Association. The fountain is composed of a pillar of polished granite, and bears a brass plate, on which are engraved some coats of arms, &c., together with the following inscription:—"This fountain is erected by his widow, in memory of Lieut.-General Molyneux Williams, K.H., who died in May, 1871, respected and beloved by all who knew him. 'Blessed are the dead who die in the Lord.'—Rev. xiv. 13." The masonry was done by Mr. George Willicombe.

The People's Gardens, Willesden.—A series of Saturday *fêtes*, to conclude the summer season of 1872, are being held at these gardens, which were opened last year in a somewhat unfinished state. The gardens have been purchased and laid out by "The People's Garden Company," with the object of affording to the shareholders and members a means of healthy and rational recreation, such as cricket, croquet, archery, boating, gymnastics, dancing, &c. The grounds comprise about fifty acres, and are well laid out. The gardens are open on Sunday afternoons to members for promenade, when a band attends, and lectures and musical entertainments are provided on that day. The club now numbers 800 members, with the privilege of introducing friends.

Waste Materials at the Vienna Exhibition of 1873.—Among the supplemental exhibitions which will be formed in connexion with the Vienna Universal Exhibition is to be one showing what steps have been taken since 1851 (the date of the first London Exhibition) in the utilisation of substances previously regarded as waste. On the one hand will be shown the waste products in all the industrial processes included in the forthcoming Exhibition; on the other hand, the useful products which have been obtained from such wastes since 1851. This is intended to serve as an incentive to further researches in the same important direction.

The Tower Subway.—The report of the directors states that the number of passengers passing through this subway during the last half-year has been 506,072, and the amount earned 1,054*l.* 6s. 4d., or sufficient to pay all working expenses and interest at the rate of 5½ per cent. per annum on the original shares. The traffic of the last half-year is 106*l.* 3s. 4d. better than that of the previous half-year. It is proposed to declare a dividend on the preference shares at the rate of 5*l.* per cent. per annum, and on the ordinary shares at the rate of 4*l.* per cent., although there are not funds in hand to pay it immediately. The report has been adopted by the shareholders.

Destructive Fire at Leeds.—On Sunday morning in last week, a fire was discovered to be raging on the extensive premises of the North-Eastern Railway goods depôt, Wellington-street, Leeds. The goods station is nearly a square. On the eastern side is the grain warehouse, 73 ft. wide, and on the western extremity is the general goods warehouse, 127 ft. in length by 227 ft. in width. The general goods warehouse was only partly finished. The fire burned throughout the day, and the mischief done was very extensive. There are suspicions that the mischief has been caused by an incendiary. The amount of damage done will, it is stated, exceed 150,000*l.* The buildings were insured.

Swimming Bath for Richmond.—A recent attempt to provide a swimming-bath at Richmond by means of a limited liability company having proved a failure, a public meeting has been held at the vestry-hall to consider the best means of providing one, under local direction and by local means. Colonel Burdett occupied the chair. It was unanimously resolved, "That this meeting is of opinion that a public swimming-bath on the River Thames, in the immediate neighbourhood of Richmond and Twickenham, is urgently needed." A committee was appointed to carry out the object in view.

Tenacious Glue.—Dissolved in nitric ether, says Dr. J. M. Maisch, in the *American Journal of Pharmacy*, glue is about twice as tenacious as when it is dissolved in water.

The Liability of Tenants.—An owner of house property having inquired at Somerset House why the property tax should be charged in excess of the income, has received an official reply stating that the valuation list is accepted as conclusive evidence of the gross value of the property, and adding that the "tenant is only entitled to deduct the tax on the amount of rent actually payable by him, and that the difference should be borne by him unless he can obtain a reduction of the charge in the valuation list, for which purpose he should apply to the assessment committee of the parish, at the office of the vestry clerk. The question is thus really a tenant's and not a landlord's question."

A Breakwater for Jersey.—The local authorities of Jersey having resolved to construct a new harbour, with the view of affording better accommodation, and greater facilities for the arrival and departure of shipping at all states of the tide, the first stone of the breakwater which is to form the protecting arm of the harbour, was to be laid on Thursday by his Excellency Major-General P. M. N. Guy, C.B., Lieutenant-Governor, assisted by Sir John Coode and the members of the Harbour Committee, in the presence of Mr. John Hammond, bailiff, the members of the States, and public bodies of Jersey.

Almshouses, Wimbledon.—Mr. Henry W. Peek, member for Mid-Surrey, has founded five almshouses, freehold tenements, at Wimbledon, and has endowed them with a view of their being occupied by deserving men within the district of Mid-Surrey. The almsmen will each have a cottage free of rent, taxes, and water-rate, and a pension of 36*l.* per annum. The first four pensioners will shortly be elected,—one by the founder himself, one by the mayor and corporation of Kingston-on-Thames, one by the mayor and corporation of Reigate, and the fourth by the magistrates of the county of Surrey.

A Forgotten Lightning Conductor.—A correspondent of the *Times*, reminding the public what an excellent conductor of electricity carbon is, gives the following advice:—"First: keep your chimneys clean. Second: in the language of the telegraphist, 'put your grates to earth,'—that is, connect each grate of your house with a solid and continuous piece of wire, like that used for telegraphic purposes, with a piece of metal buried in the earth, or with the system of iron pipes conveying gas and water through your town."

Fall of a Grand Stand.—The Manchester papers state that at the Robinson Lane well-dressing sports in connexion with the Ashton-under-Lyne wakes, the grand stand gave way, and between 300 and 400 persons were thrown to the ground. The stand was about twenty yards long, and there were on it many spectators. Just as one of the races was concluding the structure was observed by outsiders to shake, but before any warning could be given the timbers gave way. Several persons were severely shaken, and others were bruised, but no limbs were broken.

A Sea Pacificator.—Under this title Mr. Thos. Morris, architect, suggests a form of construction for ocean-shields, breakwaters, piers, lighthouses, and other marine objects. He proposes to form a platform on the tops of a series of vertical cylinders of great buoyancy, kept in their position by struts and braces, and held down to the proper level by weights or anchors. With the understanding that at a depth of 15 ft. the sea in British regions is perfectly still, Mr. Morris concludes that a platform at that distance below the surface would be undisturbed.

Illumination of Limehouse Church Clock. Mr. C. Harston has laid before the committee drawings and specifications explanatory of the proposed work, with details, as to the construction of the new dials. These are four in number, each over 13 ft. in diameter, and projecting 18 in. from the face of the clock. The plans have been approved, and the architect has been instructed to invite tenders for the work. The cost will be about 500*l.*, of which 295*l.* have been subscribed,

Tintern.—On the 14th of August the foundation-stone of a new day and Sunday school, with school-keeper's house, &c., was laid at Tintern, Monmouthshire, by Mr. Thomas Pethick, of Bristol, assisted by the ministers of the neighbourhood. The work is being carried out by Mr. W. Roberts, builder, of Chepstow, from drawings and under the supervision of Mr. E. A. Lansdoune, architect.

State Purchase of Irish Railways.—The chairman of the Dublin and Belfast Junction Railway Company, at their recent meeting, said he had no doubt whatever that the Government had serious intentions of purchasing the Irish lines. It was desirable, whatever determination the Government should come to, that no time should be lost, because it prevented the question of amalgamation going on between them and the Dublin and Drogheda and the Ulster lines.

Advance in the Price of Window Glass. The principal makers, says the *Birmingham Post*, have issued circulars stating that it is necessary, in consequence of the increase in the cost of fuel and other materials, to advance the price of window-glass. They state that for the present the net price for "fourths" crown will be 42s. per crate; and the quotation for "thirds," 15 oz. sheet, glazing quality, is 4½d. per foot, less 25 per cent. discount.

Great Fire in Kentish-town Station of North London Railway.—Throughout Tuesday night a very destructive fire has ravaged the Kentish-town Station of the North London Railway. Captain Shaw's report shows that about 230 ft. of the arrival platform, four waiting-rooms, and a signal-box were destroyed, and many of the adjacent buildings were more or less damaged.

Fall of a Quay into the Tyne.—The quay frontage at Messrs. Sheldon, Nixon, & Co.'s chemical works, at Hebburn, has fallen into the river. The quay was 200 ft. in length, and had upon it a steam crane and boiler, a coke-oven, a cooper's shed, three or four manganese stills, and 20 tons of soda-ash, all of which were precipitated into the Tyne. Fortunately, no person sustained any injury.

Coal and Steam Superseded!—Mr. John Earl Clare, of Liverpool, has succeeded (it is said) in perfecting an engine to be worked by electro-magnetism, by which an up-and-down motion is obtained whence a power is developed that is applicable to our largest ships afloat, and also to stationary and locomotive use.

New Lighthouse for Ceylon.—Messrs. Shearer, Smith, & Co., of the Dalbeattie Granite Quarries, having lately completed the supply of worked granite for the Great Basses Lighthouse, have undertaken the supply of the worked material for the sister lighthouse about to be erected on the Little Basses Rocks.

South Kensington Museum and Bethnal-green Branch.—Visitors during the week ending 24th August, at Kensington, 19,221; average of corresponding week in former years, 15,540; at Bethnal-green, 40,956.

Opening of the Glasgow Tramways.—The system of tramway communication has been inaugurated in Glasgow, by the opening of the line extending from St. George's Cross to Eglinton Toll.

Hornsey.—According to the *Rock*, a new church will shortly be commenced at Hornsey, to be called Trinity Church. It will be opened under the auspices of the Free Church of England Council.

The New Public Hall in Holloway.—Progress is being made with the Holloway Hall, Holloway-road, and the building will shortly be opened for public meetings and other purposes. It has cost about 5,000*l.*

TENDERS

For rebuilding church at Ettingshall, near Wolverhampton. Mr. W. D. Griffin, architect:—

For Church and Fittings.			
Stockton & Son	£3,929	0	0
G. & F. Higham	3,082	0	0
Lovatt	2,950	0	0
Horsman (accepted)	2,763	0	0
For Tower and Spire.			
G. & F. Higham	2,652	14	0
Lovatt	2,177	0	0
Horsman	1,890	0	0

For the erection of new front, and altering interior of premises, corner of Victoria-road, Aldershott, for the London and County Banking Company. Mr. F. Chancellor, architect. Quantities by Messrs. R. L. Curtis & Son:—

Kemp	£932	10	0
Mann	879	0	0
Jeffreys	873	5	0
Martin, Wells, & Co. (accepted)	850	0	0

For making new roads and drains on the Eversfield Estate, St. Leonards-on-Sea. Messrs. Fowler & Hill, architects:—

Hughes	£1,029	0	0
King (accepted)	835	0	0

For new banking premises at Sittingbourne, Kent, for the London and County Banking Company. Mr. C. Jocelyn Parnell, architect. Quantities supplied by Mr. Jas. Schofield :—

Seager	£3,335	0	0
Beaumont	3,329	0	0
Cooke & Green	3,116	0	0
Hill & Sons	3,089	0	0

For enlargement of hotel building at Rosstrevor, county of Down, Ireland, for Mr. W. Sanxter. Mr. W. J. Watson, architect :—

McGuirk	£510	0	0
Rantin	487	0	0
McShane & Lavery	480	0	0
Wheelan (accepted)	454	0	0

For new Wesleyan manse at Newry, county of Down, Ireland. Mr. W. J. Watson, architect :—

McShane & Lavery	£690	0	0
O'Hare	675	0	0
McGuirk	640	0	0
Wheelan	600	0	0
Rantin (accepted)	539	0	0

For carrying out alterations, and erecting new offices at the Newry Salt Works, Newry, county of Down, Ireland, for Mr. Chas. Laughey, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect :—

Wheelan (accepted)	£730	0	0

For enlargement of corn-store at Newry, county of Down, Ireland, for Mr. A. R. Walker. Mr. W. J. Watson, architect :—

Wheelan	£533	0	0
O'Hare	475	0	0

For erecting a single-story cottage at Rosstrevor, county of Down, Ireland, for Mr. Edward Greer, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect :—

Wheelan	£400	0	0
Rantin (accepted)	306	0	0

For alterations to a house at Portadown, for Mr. Richd. Pepper, county Armagh, Ireland. Mr. W. J. Watson, architect :—

Collen, Brothers (accepted)	£161	0	0

For alterations to a house at Rosstrevor, county of Down, Ireland, for Mr. Edward Greer. Mr. W. J. Watson, architect :—

Rantin	£264	0	0
Wheelan (accepted)	234	0	0

For erecting new offices for the directors of the Newry Gas Consumers' Company, at Newry, county of Down, Ireland, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect :—

Wheelan	£372	0	0
Rantin	368	0	0
McShane & Lavery (accepted)	349	0	0

For erecting four new houses, which are to form the first portion of a new terrace at Rosstrevor, county of Down, Ireland, for Mr. Edward Greer, exclusive of ironmongery, chimney-pieces, &c. Mr. W. J. Watson, architect :—

McShane & Lavery	£1801	12	0
O'Hare	1,675	0	0
Rantin	1,576	0	0
Wheelan (accepted)	1,550	0	0

For new hall and almshouses for drovers, to be built at the Metropolitan Cattle Market. Messrs. Lander & Bedells, architects. Quantities supplied :—

Warne	£4,009	0	0
Dove, Brothers	3,670	0	0
Ryder & Son	3,568	0	0
Ebbage	3,563	0	0
Jay	3,515	0	0
Williams & Son	3,468	0	0
Grover	3,347	0	0
Axford	3,275	0	0
Mann	3,193	0	0
Mansbridge	3,040	0	0

For new cattle lairs, Caledonian-road, entrance of the Metropolitan Cattle Market. Messrs. Lander & Bedells, architects. Quantities supplied :—

Mansbridge	£2,651	0	0
Williams & Son	2,559	0	0
Mann	2,537	0	0

For the erection of new school buildings at Blunsdon St. Leonard's, near Swindon, Wilts, for the Rev. W. H. Roach. Mr. William Clissold, architect :—

Harper & Son (accepted)	£335	0	0

For extending the Free Library and Museum now in course of erection at Blackburn. Messrs. Woodzell & Collcutt, architects :—

Marshall & Dent (accepted)	£766	0	0

For finishing pair of villas, Lordship-lane, East Dulwich. Mr. J. Clark, architect :—

Rooney, Brothers (accepted)	£290	0	0

For eleven cottages, for the London Jute Works, Ponder's End. Messrs. Kennard & Buck, architects :—

Hunt	£1,974	0	0
Cowper	1,740	0	0
Clark	1,700	0	0
Tarrant	1,528	0	0
Rist & Brown	1,525	0	0
Field & Son	1,480	0	0
Crook & Wall	1,470	0	0
,, (Concrete)	1,370	0	0
Norman	1,265	0	0

For repairs and alterations to No. 10, Queen's-gardens, Hyde Park, for Mr. H. Montague. Messrs. Davis & Emanuel, architects :—

Goodwin	£578	0	0
Williams & Son	458	0	0
Wagner	456	0	0
Temple & Foster	444	0	0
Verrall	413	0	0

TO CORRESPONDENTS.

J. F. M.—J. F. L.—S. S. P.—W. A. M.—F. R.—S.—J. M. H.—J. B.—F. B. P.—G. & Son.—H. M. C.—R. R.—C. S.—C. D.—E. S.—H. W. T.—S. & R.—R. Y.—P. C. O.—J. H. S. (send us a photo. from the tower itself when finished).—B. F. (thanks. No).—J. B. (we will inquire).—G. B.—T. L.—J. A. B.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

NOTICE TO SUBSCRIBERS.

Advertisements cannot be received for the current week's issue later than **THREE o'clock p.m.** *on THURSDAY.*

The Publisher cannot be responsible for Testimonials *left at the Office in reply to Advertisements, and strongly recommends that* Copies only *should be sent.*

In consequence of the Reduction in the Newspaper Postage, Subscribers within the United kingdom can now be supplied with The Builder *direct from the Office at the rate of Nineteen Shillings per annum,* payable in advance.

ALLEN & COMPANY,

ART FOUNDERS,
ENGINEERS,
MERCHANTS, AND
CONTRACTORS,
201, UPPER THAMES STREET,
LONDON, E.C.

Manufacturers of
LAMP PILLARS,
GAS LAMPS,
FOUNTAINS, GATES,
RAILING, ETC.
Either Plain or Bronzed, in the Highest Style of Art.

GAS and WATER-WORKS ENGINEERS.

A Volume of the NEWEST DESIGNS forwarded on receipt of 5s. in stamps, and allowed on first order. Sole importers of Barbezat's French Iron Work.

Bath and other Building Stones of Best Quality.—RANDELL, SAUNDERS, & CO. Limited, Quarrymen and Stone Merchants. List of Prices at the Quarries and Depôts, also Cost of Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[Advt.]

Ashton & Green, Slate, Iron, and Marble Merchants, and Quarry Agents, keep the largest and best selected Stocks of Bangor, Portmadoc, Green Roofing Slates, Slate Slabs, and every description of Slate Goods, Marble and Enamelled Slate Chimneypieces, Stoves, Ranges, Rainwater Goods, and General Castings. A. & G.'s special Red Ridge Tiles. Drawings and prices upon application. Offices and Showrooms, 14 and 15, Bury-street, St. Mary-Axe, London, E.C. Agents for sale of Whitland Abbey Green Slates in town and country.—[Advt].

Bills of Quantities, Specifications, &c., Lithographed by ROBT. J. COOK & HAMMOND, 29, Charing-cross, S.W. Accuracy is guaranteed; punctuality may with confidence be relied upon. Plans and Drawings Copied, Traced, or Lithographed.—[Advt.]

IMPERIAL FIRE INSURANCE COMPANY. Established 1803.
No. 1, Old Broad-street, E.C. and 16 and 17, Pall-mall, S.W.
Capital, 1,600,000*l.* Paid up and invested, 700,000*l.*
JAMES HOLLAND, Superintendent.

DEATH or INJURY from ACCIDENT, with the consequent LOSS of TIME and MONEY.
Provided for by a Policy of the RAILWAY PASSENGERS ASSURANCE COMPANY.
Against Accidents of all kinds.
An Annual Payment of 3*l.* to 6*l.* 5*s.* Insures 1,000*l.* at Death, or an allowance at the rate of 6*l.* per week for Injury.
61, CORNHILL, and 10, REGENT-STREET, LONDON.
WILLIAM J. VIAN, Secretary.

PERFECTION in BOOKKEEPING.—Builders and Others desiring a really good system, can have a SET of MODELS for BUILDER'S BOOKS, by DOUBLE ENTRY, to which was awarded the prize offered in "The Builder," No. 1,180, and which has been adopted by many large firms. Also a Modified Arrangement by Single Entry, suitable for small builders.—Address, E. A. 4, St. George's-road, Regent's Park, London.

Bound in cloth, 1s. 6d. or post free for 20 stamps.
STABLES and STABLE FITTINGS.
"Includes a considerable amount of useful information on the subject of which it treats."—*Builder*, August 27, 1870.
ST. PANCRAS IRONWORK COMPANY, Old St. Pancras-road, London, N.W.

NOTICE.—To the ARCHITECTS of GREAT BRITAIN; also the CONTRACTORS.
Early in AUGUST A NEW WORK will be published,
EXECUTED EXAMPLES by MODERN ARCHITECTS. Four Plates. Imp. 4to. with Four Pages of Letterpress and Wrapper Monthly. Price to Subscribers, 7s. 6d.; Non-Subscribers, 10s.
The First Number will contain a CHURCH, SCHOOL, MANSION, and a VILLA. The Architects have kindly consented to lend their drawings, and to become subscribers. All Architects wishing the insertion of their drawings, will please forward same, carriage paid, with a subscription order. The name and address of each Architect will be given, also the Contractor's estimate for erection, and each monthly number will be varied.
A New Work just published on
SPECIFICATIONS, by F. ROGERS, Architect, after the MODEL of BARTHOLOMEW'S. 8vo. lettered. 1*l.* 10*s.*
London: B. A. SPRIGG (Original Publisher of all Atchley & Co.'s Publications), 106, Great Russell-street, Bedford-square.

New edition. 4s. strongly bound, postage 1d.
THE LAND VALUER'S BEST ASSISTANT: being Tables for Calculating the Value of Estates. To which are added Tables reducing Scotch, Irish, and Provincial Customary Acres to Statute Measure; Miscellaneous Information, &c. &c
By R. HUDSON, C.E.
"Of incalculable value to the professional man."—*Farmer's Journal.*
London: LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

8vo. cloth, with numerous Engravings, 1*l.* 8*s.* (postage 1*s.* 6*d.*)
A GENERAL TEXT-BOOK, for the Constant Use and Reference of Architects, Engineers, Surveyors, Solicitors, Auctioneers, Land Agents, and Stewards.
By EDWARD RYDE.
To which are added several Chapters on Agriculture and Landed Property, by PROFESSOR DONALDSON.
London: LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

NO MORE LAWYERS' BILLS.
Ninth Edition, enlarged and improved, 12mo. cloth, price 6s. 6d.; post free, 7s. 2d.
EVERY MAN'S OWN LAWYER. A HANDYBOOK of the PRINCIPLES of LAW and EQUITY. Including the Laws relating to Patents and Trade Marks, Contracts, Warranties and Guarantees, Forms of Agreement, Bonds, Notices, &c. Invaluable to architects, surveyors, builders, &c.
"No Englishman ought to be without this book."—*Engineer.*
London: LOCKWOOD & CO. 7, Stationers'-hall-court, E.C.

THE ART-JOURNAL for September (price 2s. 6d.) contains the following LINE ENGRAVINGS:—
I. THE CRITICS, after Henriette Browne.
II. THE CHILD MOSES, after F. Barzaghi.
III. THE TOMB OF GRACE DARLING, after C. W. Nicholls.
Literary Contributions;—Flaxman as a Designer. No. III. Homer and Hesiod, by G. F. Teniswood, F.S.A. illustrated; Visits to Private Galleries—The Collection of William Cosens, esq.; Photographs of the Collections in the British Museum; Minor British Industries—Marezzo Marbles; The Vienna Exhibition of 1873; The Museums of England—The Caerleon Museum and the Hull Museum, by Llewellynn Jewitt, F.S.A. illustrated; Celebrated Churches of Europe—Milan Cathedral and Cordova Cathedral, illustrated; Wimbledon, illustrated; Pictures at the International Exhibition; Fragrant Woods, by P. L. Simmonds; Schools of Art; Art-Union of London; Arctic Scenery; &c. &c. Also, with the September number is published the fifth portion of the ART-JOURNAL ILLUSTRATED CATALOGUE of the International Exhibition, 1872, by George Wallis, Keeper of the Art-Collections, South Kensington.
*** The Volume for 1871 is now ready, price 31s. 6d. bound in cloth.
LONDON: VIRTUE & CO. IVY LANE; and all Booksellers.

New and Revised Edition, price 2s. 6d. cloth.
ON the RELATION between SCIENCE and RELIGION.
By GEORGE COMBE.
Edinburgh: MACLACHLAN & STEWART.
London: SIMPKIN, MARSHALL, & CO.

ARCHITECTURE.
RE-ISSUE OF THE FOLLOWING STANDARD WORKS PUBLISHED BY
J. JOBBINS,
3, WARWICK COURT, HOLBORN, LONDON, W.C.

EXAMPLES of BUILDING CONSTRUCTION,
Intended as an Aid Mémoire for the Professional Man and the Operative. Being a Series of Working Drawings to a large scale, exemplifying the Arrangement and Details adopted in carrying out the several branches of Trade requisite for Public and Private Edifices. In Eighty Parts, 2s. 6d. each; or in Four Volumes, bound in Cloth, Twelve Guineas.
N.B.—This work is extensively used in the Science and Art Department, South Kensington.

GOTHIC ORNAMENTS,
Being a Series of Examples of Enriched Details and Accessories of the Architecture of Great Britain. By JAMES K. COLLING, Architect. In Forty-eight Parts, 3s. each; or in Two Volumes, bound in cloth, Seven Guineas.

DETAILS of GOTHIC ARCHITECTURE,
Measured and drawn from Existing Examples. By JAMES K. COLLING, Architect. In Thirty-eight Parts, 2s. 6d. each; or in Two Volumes, bound in cloth, Five Guineas.

AN ANALYSIS OF
ANCIENT DOMESTIC ARCHITECTURE,
Exhibiting some of the best Examples in Great Britain. From Drawings and Measurements taken on the Spot, by F. T. DOLLMAN and J. R. JOBBINS. In Forty Parts, 2s. 6d. each; or in Two Volumes, bound in cloth, Five Guineas.

ARCHITECTURAL, ANTIQUARIAN, NAVAL, MILITARY, & MEDIÆVAL DRAWINGS,
Landscape, Sale Plans, Railway Plans, and Sections Lithographed in the best style. Bills of Quantities, Circular Notes, Invoices, Cards, and every description of Commercial and Colour Printing.
J. JOBBINS, 3, WARWICK COURT, HOLBORN, LONDON, W.C

W. H. BARBER, Surveyor, 12, Buckingham-street, Strand, W.C. twenty years with Messrs. Myers and Messrs. Mansfield, has REMOVED his OFFICES to the above address. Quantities and Estimates prepared, and every kind of assistance rendered on moderate and mutual terms. DISPUTED AND INTRICATE ACCOUNTS ESPECIALLY ATTENDED TO.

MR. ARCHIBALD D. DAWNAY, C.E. CONSULTING ENGINEER and SURVEYOR, 25, Walbrook, London.—CALCULATIONS, DESIGNS, and ESTIMATES prepared for IRON CONSTRUCTIONS, GASWORKS, &c. LEVELLING and SURVEYING. Professional assistance generally.

TO CARPENTERS AND JOINERS.
QUANTITY of CARPENTER'S WORK, to Two Houses, at Stoke Newington, TO BE LET, labour only.—Apply, RICHARDSON, BROTHERS, 81A, Bishopsgate-street Within, E.C.